MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Nonpoint Source Management Plan
Volume III

Statewide Plan And Goals
1999 UPDATE

EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
BOB DURAND, SECRETARY
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
LAUREN A. LISS, COMMISSIONER
BUREAU OF RESOURCE PROTECTION
GLENN HAAS, ACTING ASSISTANT COMMISSIONER
DIVISION OF WATERSHED MANAGEMENT
DAVID TERRY, ACTING DIRECTOR

NOTICE OF AVAILABILITY

LIMITED COPIES OF THIS REPORT ARE AVAILABLE AT NO COST BY WRITTEN REQUEST TO:

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
627 MAIN STREET
WORCESTER, MA 01608

This report is also available from the Department of Environmental Protection, Division of Watershed Management's home page on the World Wide Web at:

http://www.state.ma.us/dep/brp/wm/wmpubs.htm

NOTE: For web publication, corrections to the printed version of this report are highlighted in purple.

Furthermore, at the time of first printing, eight (8) copies of each report published by this office are submitted to the State House in Boston; these copies are subsequently distributed as follows:
On shelf; retained at the State Library (two copies);
Microfilmed; retained at the State Library;
Delivered to the Boston Public Library at Copley Square;
Delivered to the Worcester Public Library;
Delivered to the Springfield Public Library;
Delivered to the University Library at Umass Amherst;
Delivered to the Library of Congress in Washington, D.C.

Moreover, this wide circulation is augmented by inter-library loans from the above-listed libraries. For example, a resident of Winchendon can apply at their local library for a loan of any DEP/Division of Watershed Management report from the Worcester Public Library.

A complete listing of reports published since 1963 is updated annually and printed in July. This report, entitled, "Publications of the Massachusetts Division of Watershed Management – Watershed Planning Program, 1963 – (current year)" is also available by writing to the DWM in Worcester.

DISCLAIMER

Reference to trade names, commercial products, manufacturers, or distributors in this report constitutes neither endorsement nor recommendation by the Department of Environmental Protection for use.

NONPOINT SOURCE MANAGEMENT PLAN – VOLUME III

STATEWIDE PLAN AND GOALS

Researched and Compiled by:

Eben W. Chesebrough

Department of Environmental Protection
Bureau of Resource Protection

Report Number: MS-E-7

MASSACHUSETTS DEPARTMENTOF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
WORCESTER, MASSACHUSETTS

APRIL 2001

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

ITEM **PAGE**

TABLE OF CONTENTS (Continued)

ITEM **PAGE**

LIST OF TABLES

ITEM **PAGE**

LIST OF FIGURES

ITEM **PAGE**

LIST OF APPENDICES

MASSACHUSETTS NONPOINT SOURCE MANAGEMENT PLAN

UPDATE 1999-2000

EXECUTIVE SUMMARY

The Nonpoint Source Management Plan was originally developed by the Department of Environmental Protection in 1988 pursuant to Section 319 of the Clean Water Act (33 U.S.C.A., Sec. 1251 et. seq.). The current document (revised in 1994 and again in 1999) is a comprehensive update of the original plan. The updated Nonpoint Source Management Plan is presented in four volumes and what follows is an executive summary of the Management Plan in general and each volume in particular.

IN GENERAL

The Nonpoint Source Management Plan sets forth an integrated strategy and identifies programs to prevent, control and reduce pollution from nonpoint sources to protect and improve the quality of the waters of the Commonwealth. The Clean Water Act, Section 319, specifies the contents of the Management Plan to ensure that the plan realistically addresses all of the major categories of nonpoint source pollution in the state. It is important to understand that the plan is an implementation strategy for best management practices with attention given to funding sources and a milestone schedule.

The Massachusetts Nonpoint Source Program has developed as a dynamic and effective program characterized by the nine-key elements described in the "Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years" issued by EPA in May of 1996. The State program focuses on strong working partnerships and watershed-based solutions implemented through the Massachusetts Watershed Initiative.

Each year the Congress appropriates funds under Section 319 to assist the states in implementing their approved Nonpoint Source Management Plans. Only those implementation strategies contained in the Management Plan are eligible for federal funding. Implementation activities include regulatory enforcement, technical assistance, education, training, technology transfer and demonstration projects.

The current update of the Nonpoint Source Management Plan makes specific reference to the Coastal Nonpoint Pollution Plan mandated by Section 6217 of the Coastal Zone Reauthorization Act of 1990. This coastal plan was granted provisional approval in 1995 and has been adopted into the Section 319 Management Plan. The Coastal Plan strategies and enforcement policies will be implemented state-wide as appropriate within the context and schedule of the Watershed Initiative.

VOLUME I-STRATEGIC SUMMARY

This volume is a strategic summary of the 1999 updated Nonpoint Source Management Plan. It contains certain sections of the Management Plan that clearly focus on the core Nonpoint Source (NPS) Program and provides a strategic approach for the direction of the program for the foreseeable future. The Management Plan itself is contained in three volumes with over four hundred pages. This report distills much of the Management Plan into a more manageable format and keys into the strategic actions underway. It is hoped that the present document is both readable and usable for watershed teams, local governments, watershed associations, and other state/federal agencies that will be responsible for assisting in the critical nonpoint source implementation effort.

The sections of this summary report represent components of the overall state NPS Strategy as set forth in the NPS Management Plan, revised and upgraded in 1999 in conformance with EPA's Nine-Key Elements. The overall goal of the NPS strategy is to preserve and augment the water quality of the waters of the Commonwealth which are impaired or threatened by nonpoint source pollution.

This goal will be addressed through the various program components described in the NPS Management Plan and summarized in this report.

These program components will:

1. Provide regional guidance and assistance to the watershed teams and public to:

   a. identify and prioritize NPS problems in each watershed,
   b. develop specific grant proposals for implementation projects, and
   c. target funding to these priorities to address and remediate NPS impacts to water quality.

2. Integrate NPS strategic actions into the Massachusetts Watershed Initiative (MWI) to achieve more targeted implementation.

3. Integrate Total Maximum Daily Load (TMDL) recommendations (which are mostly NPS BMPs) into the MWI to achieve effective implementation by the watershed teams and municipalities and thus attain water quality standards in the state's impaired waterbodies.

4. Identify short and long-term strategies for both the NPS Section 319 Program and the Coastal Section 6217 NPS Program and effectuate their implementation through specific segment-by-segment analysis and subsequent remediation by the watershed teams and DEP.

VOLUME II-NONPOINT SOURCE PROGRAM and the MASSACHUSETTS WATERSHED INITIATIVE

Volume II of the Nonpoint Source Management Plan sets forth a highly focused and structured nonpoint source strategy that is closely integrated into the Massachusetts Watershed Initiative. Each year a certain number of basins are scheduled so as to cover the entire state within five years.

Each year of the five year cycle focuses on a distinct set of activities with a common objective:

Year 1 - Outreach, education and information gathering
Year 2 - Water resource monitoring; outreach
Year 3 - Water resource assessment; outreach
Year 4 - Implementation of water quality corrective actions and BMPs; outreach
Year 5 - Continued implementation and evaluation; outreach

Volume I1 of the Nonpoint Source Management Plan describes this statewide watershed initiative and how the 305(b), 303(d), and TMDL process all fit within the five-year cycle.

VOLUME III-STATEWIDE PLAN AND GOALS

Volume III of the Nonpoint Source Management Plan is a technical update and revision of the original 1988 Management Plan. This third volume generally follows the original plan format and updates the state's nonpoint source related programs. Certain sections have been deleted, others added and still others amended to reflect programmatic changes and progress made by Massachusetts since the original plan was written in 1988.

As mentioned under Volume II, emphasis has been given to the emerging Coastal Nonpoint Pollution Plan authorized under Section 6217 of the Coastal Zone Reauthorization Act of 1990. The Coastal Plan has developed and will implement management measures to address nonpoint source categories of pollution common throughout coastal Massachusetts. It has been decided to apply the Coastal Plan's management measures state-wide. The Coastal Plan was essentially completed in 1995 and will be incorporated into the 319 Management Plan by way of addendum.

Volume III also stresses the watershed approach, the central theme of DEP's core Nonpoint Source Program as described in Volume II. The watershed approach is likewise a major tenet of the Clean Water Strategy which provides a conceptual framework for DEP's water resource programs.

Section VI of Volume III contains long-term strategies. Some of these long-term strategies are ongoing and some constitute new initiatives. It is felt that these strategies have high potential to prevent and abate nonpoint source pollution in Massachusetts. The long-term strategies are:

LONG-TERM STRATEGIES

A. Implement the Massachusetts Watershed Initiative

B. Title 5 Regulations For the Subsurface Disposal of Sanitary Sewage

C. Soil Erosion and Sedimentation Control Law

D. Stormwater Runoff Control

1. Subdivision Control Law
2. Chapter 90 Local Road Improvements
3. State, County, Federal Roads
4. Stormwater Management Policy Handbook

E. Public Water Supply - Wellhead Protection Program and Other Programs

F. Bay Programs

1. Buzzards Bay and Mass Bays
2. Waquoit Bay
3. Narragansett Bay

G. Cape Cod Commission - Sole Source Aquifer Protection.

H. Rivers Protection Act of 1996.

I. Outreach and the Mega Manual.

J. Nutrient Loading Approach to Wastewater Permitting and Disposal.

K. Develop and Implement TMDLs.

L. Cooperate with Implementation of Section 6217 CZM Coastal Nonpoint Source Plan.

Volume III further describes how the original Nonpoint Source Advisory Committee has been replaced by functioning Watershed Teams. Each Watershed Team has many non-state representatives which act as individual watershed advisory committees. It is the watershed team which directs and prioritizes all of the basin activities within the context of the Watershed Initiative.

VOLUME IV-WATERSHED NONPOINT SOURCE ACTION STRATEGIES

The major purpose of the nonpoint source action strategies is to compile, segment by segment for each major watershed, the 303(d) impairments, other outstanding water quality issues, the data/information sources, and recommendations to address the water quality impairments.

The action strategies are designed to focus on the most pressing situations causing violations of the state's water

quality standards based upon dependable and verifiable data sources. This volume of the NPS Management Plan will be updated, on the average, every two years.

The action strategies are meant to primarily assist the DEP regions and the EOEA watershed teams to focus their collective energies on priority water quality impairments. It is not intended to replace or compete in any way with the watershed team action plans.

The action strategies are also focused primarily on nonpoint source causes of the water quality impairments. These compilations are not intended to be encyclopedic regarding watershed water quality issues. The emphasis is upon 303(d) water quality impairments with recommendations of actions to address the situations.

The overall layout and format is intended to be brief and succinct with what we hope is just the essential information presented in an easy to read presentation. Several of the data sources listed are rather weighty volumes which may intimidate some of the more inveterate researchers. Thus the present effort to reduce a large amount of information down to some bare essential action recommendations. Any person interested in more detail is encouraged to consult any of the listed references (sources).

NONPOINT SOURCE MANAGEMENT PLAN

I. INTRODUCTION

A. DESCRIPTION OF PLAN UPDATE

This document constitutes an update and revision of the 1994 Massachusetts Nonpoint Source Management Plan. The original Management Plan was developed by the Department of Environmental Protection (DEP) and approved by the U.S. Environmental Protection Agency (U.S. EPA) in conformance with the requirements of Section 319 of the federal Clean Water Act (33 U.S.C. §319). This update and revision is written in four parts: Volume I-IV.

The Massachusetts Nonpoint Source Management Plan has been upgraded and reorganized. In place of the customary two-volume plan there is now a four volume plan:

Volume I - Strategic Summary of the Massachusetts Nonpoint Source Management Plan. This document binds together all of the action strategies of the Management Plan into a cohesive yet compact report.

Volume II - The Nonpoint Source Program and the Massachusetts Watershed Initiative. This is the traditional Volume I of the Management Plan.

Volume III - The State-Wide Plan and its Goals. This is the traditional Volume II of the Management Plan.

Volume IV - Nonpoint Source Strategies. This volume will include the NPS Action Strategies for all 27 watersheds as developed by the NPS regional coordinators.

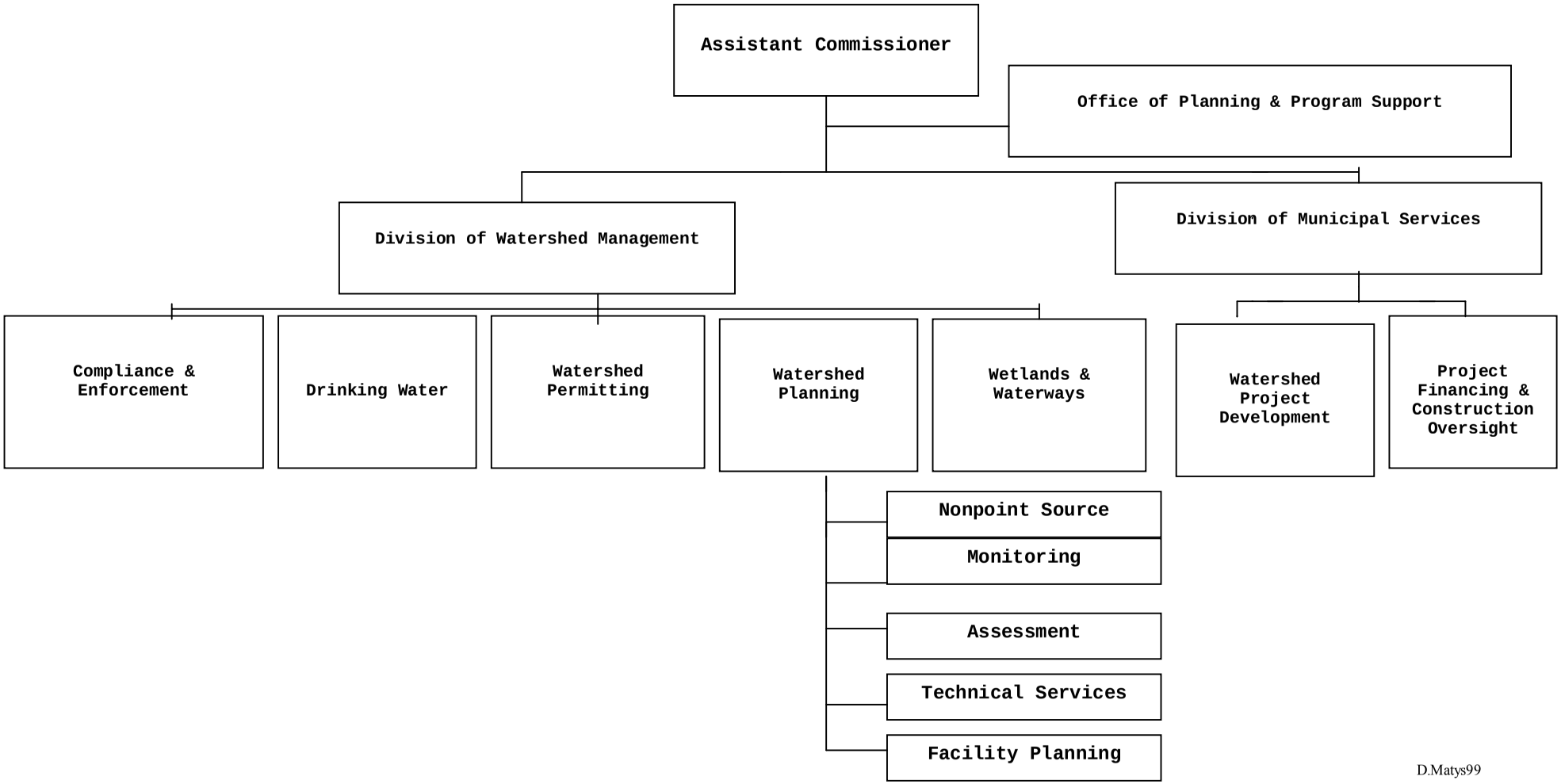
The first three volumes will be updated every five years or so but the fourth volume will be updated more frequently as progress is measured and the action strategies are implemented by the watershed teams and DEP.

B. PURPOSE OF PLAN

The nonpoint source management plan proposes an orderly and progressive approach to prevent continued degradation of Massachusetts surface and groundwaters due to nonpoint sources and to develop restorative actions of waters where impacts from nonpoint sources have been observed. The plan should be viewed as a part of the comprehensive state-wide clean water strategy intended to protect drinking water supplies, fish and shellfish, wetlands, wildlife habitat and biodiversity, recreation areas, open space, and physical shoreline features. The range and type of known nonpoint source water quality problems have been identified in a state-wide assessment report (Commonwealth of Massachusetts, Summary of Water Quality, 1998). The Commonwealth of Massachusetts recognizes the need to protect the quality and biological health of its waters, and, while clear, scientific evidence does not always exist to define the size and effects of nonpoint inputs, there is sufficient knowledge to identify the need for a control program in order to develop priorities and to begin source control efforts. Ultimately, the goal is to implement a dynamic, effective nonpoint source program designed to achieve and maintain beneficial uses of water.

FIGURE 1

ORGANIZATIONAL CHART OF THE BUREAU OF RESOURCE PROTECTION



This plan is a dynamic strategy which the Commonwealth intends to implement over the next five years. It will be updated and reevaluated on a regular basis. The plan recognizes the complex nature of the issues and emphasizes the importance of prevention due to the extensive costs of restoration. The need for continued scientific research and monitoring is identified. Because of the diversity and magnitude of the problems, there is a critical need for networking and sharing of responsibilities among many state, regional, and local groups, as well as interstate cooperation, since watersheds and nonpoint problems cross political boundaries. The fundamental responsibility, however, will fall to state and local governments, and the purpose of the plan is to organize a rational, cooperative approach as implemented by the Division of Watershed Management through the Massachusetts Watershed Initiative. Overall responsibility for coordination of NPS activities involving groundwater, wetlands, near coastal waters, small streams, rivers and lakes resides within the DEP Office of Assistant Commissioner for Resource Protection. This person will be responsible for coordinating the programs of the Division of Watershed Management, and Division of Municipal Services to include the Nonpoint Source Management Plan with the implementation of the Watershed Initiative and State Clean Water Strategy.

C. COASTAL NONPOINT POLLUTION CONTROL PROGRAM

One of the greatest changes which will directly effect Massachusetts was the enactment by Congress of the 1990 amendments to the Coastal Zone Act (CZARA, 1990). These amendments included under Section 6217 the specifications and requirements for a state coastal nonpoint pollution control program. In Massachusetts DEP and CZM have agreed that the coastal nonpoint pollution control program will be made an integral part of the overall state Nonpoint Source Management Plan. The provisions of the coastal plan will thus be implemented on a state-wide basis for the simple yet compelling reason of maintaining consistency of purpose and applicability of NPS management measures. The present volume of the Management Plan incorporates the coastal plan as a separate addendum. Recent EPA administrative changes to the coastal plan are described in Volume II of this plan.

The coastal plan addresses virtually all of the nonpoint source categories and subcategories of pollution common to Massachusetts. A critical element of the coastal plan is that it must "provide for the implementation, at a minimum, of management measures in conformity with the guidance published [by EPA] to protect coastal waters generally ...". (Section 6217(b) of CZARA, 1990). The guidance for specifying management measures for sources of nonpoint pollution in coastal waters are defined in Section 6217(g)(5) as:

> Economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives.

The management measures guidance is to include at a minimum six elements set forth in Section 6217(g)(2):

1) A description of a range of methods, measures, or practices, including structural and nonstructural controls and operation and maintenance procedures, that constitute each measure;

2) a description of the categories and subcategories of activities and locations for which each measure may be suitable;

3) an identification of the individual pollutants or categories or classes of pollutants that may be controlled by the measures and the water quality effects of the measures;

4) quantitative estimates of the pollution reduction effects and costs of the measures;

5) a description of the factors which should be taken into account in adapting the measures to specific sites or locations, and;

6) any necessary monitoring techniques to accompany the measures to assess over time the success of the measures in reducing pollution loads and improving water quality.

The Massachusetts Coastal Nonpoint Pollution Control Program provides for the implementation of management measures that are in conformity with the above management measures guidance. This, of course, is no small task and an undertaking of considerable import. This is consistent with the legislative intent of Section 6217 of the CZARA which was not intended to supplant the existing coastal zone management program and Section 319 state nonpoint source management program. Rather, it is intended as an update and expansion of the existing Nonpoint Source Management Plan and is to be coordinated closely with the existing coastal zone management program.

There is also the requirement to develop coordinated interagency cooperation. In furtherance of this goal, the Coastal Zone Management Office and the Department of Environmental Protection have entered into a Memorandum of Understanding (MOU) to establish a working relationship and clarify the agency' roles relative to the development and implementation of the Coastal Nonpoint Pollution Control Program:

MEMORANDUM OF UNDERSTANDING BETWEEN THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE MASSACHUSETTS COASTAL ZONE MANAGEMENT OFFICE

PURPOSE: The purpose of this MOU is to establish the basis for cooperation between BRP/DEP and CZM on the development and implementation of the Coastal NPS Program and the integration of the two management plans--the 319 NPS management plan being updated by DEP in 1993 and the 6217 coastal NPS plan scheduled to be completed in July 1995.

Under Section 6217 of the Federal Coastal Zone Act Reauthorization Amendments of 1990, state coastal zone programs are required to develop coastal nonpoint source management plans in accordance with program guidance from NOAA and technical guidance from EPA. The technical guidance contains requirements, or management measures, for nonpoint source controls which state programs must insure will be implemented--in an enforceable manner. Plans produced by the states must analyze:

- the enforceability of existing programs for controlling nonpoint source pollution,
- the effectiveness of existing programs, and
- propose changes to correct gaps in legislative and regulatory authorities for addressing nonpoint source pollution.

In 1989, the Massachusetts Department of Environmental Protection, in response to the Section 319 requirements in the reauthorization of the Clean Water Act of 1987, prepared a nonpoint source management plan intended to provide a guidelines with milestones for controlling nonpoint source pollution on a state-wide basis across the entire state. This management plan is currently being updated to reflect new information and strategies for nonpoint source pollution control.

MCZM'S AGREEMENTS

MCZM AGREES:

1. To prepare and submit to EPA and NOAA the Section 6217 Coastal Nonpoint Source Management Plan for Massachusetts according to the program guidance from NOAA and the technical guidance from EPA and which is consistent with BRP/DEP's state-wide Nonpoint Source Management Plan;

2. That BRP/DEP will remain the lead responsible agency for the implementation of the state-wide NPS plan;

3. To consult with BRP\DEP in the development and implementation of enforceable policies, as defined in the program guidance, in order to comply with the requirements in the technical guidance document;

4. To actively involve DEP in the development of the 6217 plan. CZM will provide BRP/DEP with drafts of the plan with an opportunity to comment and meet with CZM staff prior to finalization of policies and recommendations.

5. To assist and cooperate with DEP on a technical assistance and public education effort aimed at 1) improving community understanding of nonpoint issues and problems and 2) at establishing the link between water quality and land use decisions on the local level. Regular meetings, at least on an annual basis, will provide the basis for coordination between BRP/DEP and CZM.

6. To develop cooperatively with BRP/DEP the components of the required water quality monitoring program intended to demonstrate the effectiveness of the management measures as they are implemented.

DEP AGREEMENTS

DEP AGREES:

1. To adopt and incorporate appropriate components of the Section 6217 Coastal Nonpoint Source Management Plan into the existing state 319 nonpoint source management plan;

2. To provide assistance with the development of the Section 6217 Plan by a) providing the necessary water quality information and regulatory program information and b) reviewing and commenting on drafts of the various program analyses as they are prepared;

3. To work with MCZM on implementation of enforceable components, including the preparation and completion of any necessary legislative and regulatory changes identified in the Coastal NPS Plan. The parties agree and stipulate that BRP/DEP retains discretion over the content and timing of any BRP/DEP regulatory or policy changes, provided that all statutory deadlines contained in the federal legislation for program implementation are met;

4. To coordinate closely with MCZM in the development of a technical assistance, public education, and outreach effort, as required by the federal guidance, for the purpose of improving and empowering local governments and citizens in their efforts to manage local land use decisions as they impact water quality;

5. To provide advice and expertise to CZM on the development of a coordinated water quality monitoring program which will meet the federal requirements to demonstrate water quality improvements subsequent to the implementation of the management practices and regulatory program changes as identified in the analysis of state programs. BRP/DEP agrees to be the lead agency for implementation of the state-wide monitoring program;

6. To remain the lead agency for the implementation of the state nonpoint source control program.

7. To accept CZM's definition of the coastal zone for 6217 purposes.

If at any point there is an unresolvable difference of opinion between DEP and CZM concerning the execution of any of the above agreements, the Secretary of Environmental Affairs will be the final arbitrator and will make the final decision.

D. CLEAN WATER STRATEGY

The purpose of the Clean Water Strategy is to provide a conceptual framework for the DEP's Water resources programs, centered in the Bureau of Resource Protection (BRP). The overall goal of the strategy is to protect the environmental integrity of the state's water resources by putting the necessary tools in place to set resource - based priorities, integrate programs geographically and improve the effectiveness and efficiency of programs that cross division lines.

There are three major elements of the Clean Water Strategy:

1) Watersheds are the basic planning unit for focussing and integrating water resource protection programs. It is the policy of the BRP that monitoring, permitting, compliance, enforcement, public outreach and nonpoint source programs will be coordinated within watersheds, which will be examined in depth every five years.

2) The Geographic Information System (GIS) is the most critical management information system for establishing water resource protection priorities. GIS will be used to identify the most sensitive (and thus high priority) sub-watersheds in the state by overlaying water resource attributes of state-wide significance.

3) The third element of the Clean Water Strategy is improved program coordination, where the theme of "less process, more protection" plays out.

This aspect of the strategy borrows from the concept of Total Quality Management, which calls for continuously improving ways to effectively and efficiently deliver services. As described in Volume I of the Management Plan, the Division of Watershed Management is committed to this principle by integrating the Nonpoint Source Program into the Watershed Initiative with the other major water quality programs.

The Clean Water Strategy focuses attention on the themes of source reduction and pollution prevention. A shift of emphasis and resource expenditure from an "end of pipe treatment technology" to source reduction and pollution prevention is a goal of the Clean Water Strategy and the Nonpoint Source Management Plan. The ultimate goal is consistent with the national goal of the Clean Water Act - attaining fishable and swimmable waters. The bottom line is the enhancement and protection of water quality. This goal is the heart and soul of the Nonpoint Source Management Plan.

The complete Clean Water Strategy is attached to this plan as Appendix A.

E. NONPOINT SOURCE POLLUTION DEFINED

Nonpoint source pollution is caused by rainfall or snow melt moving over and through the ground and carrying natural and manmade pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters and groundwater. Atmospheric deposition and hydrologic modifications are also sources of nonpoint pollution. For the purposes of this Management Plan the definition of nonpoint source pollution will be the same as that used by the U.S. EPA (U.S. EPA, Nonpoint Source Guidance, December, 1987; June, 1993):

NONPOINT SOURCE (NPS) POLLUTION: NPS pollution is caused by diffuse sources that are not regulated as point sources and normally is associated with agricultural, silviculture and urban runoff, runoff from construction activities, etc. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, and radiological integrity of water. In practical terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation (atmospheric deposition), or percolation. It must be kept in mind that this definition is necessarily general; legal and regulatory decisions have sometimes resulted in certain sources being assigned to either the point or nonpoint source categories because of considerations other than their manner of discharge. For example, irrigation return flows are designated as "nonpoint sources" by section 402(1) of the Clean Water Act, even though the discharge is through a discrete conveyance.

F. WATERSHED APPROACH

As described in Volume II the state's Nonpoint Source Program will be integrated into and implemented on the watershed initiative approach. This pertains to the core NPS Program funded under Section 319 of the Clean Water Act. Not all of the ancillary state programs that address nonpoint source pollution are similarly focused. Programs which deal with issues such as underground storage tanks, road deicing chemicals, septic systems, enforcement activities and the like cannot readily or practically be organized on a watershed basis. Other programs, however, such as those dealing with silviculture, agriculture, well-head protection, NPDES permits, soil erosion and the like can be implemented on a watershed basis.

The concept of watershed planning and program implementation for water quality improvement and protection is compelling and eminently logical.

MASSACHUSETTS WATERSHED INITIATIVE

The **Massachusetts Watershed Initiative** is both a structure and process for implementing the watershed approach. The methodology is intended to be a dynamic framework which can be adapted to meet the unique opportunities and conditions in each watershed.

The key features of the Watershed Management Methodology, essential for successful implementation of the watershed approach, are:

- The co-leadership roles of the state, watershed associations or other citizen groups, the business community, and municipalities in implementing the watershed approach.
- Twenty-seven interdisciplinary watershed teams who are managed by 20 full-time team leaders.
- Community-based outreach, resource assessment, planning and implementation involving all stakeholders.
- The sub-watershed focus of problem identification and Watershed Action Plan development.
- The goal of targeting allocation of limited dollars to watershed priorities, so they are used where we can achieve the most environmental protection for the dollars available.
- That we will not pick priority watersheds - we were not going to pick winners and losers. The key to effectively protecting our environment and to a watershed approach is local action and empowering local people to protect their local resources. This type of empowerment is happening in all our watersheds.
- Integrating local, state and federal environmental programs on a watershed basis, using the watershed workplans as the vehicle for integrating specific activities in a specific year.

Public Participation and Oversight

The **Watershed Initiative Steering Committee (WISC)** developed the Watershed Management Methodology. The WISC is an advisory committee, which provides advice and guidance to the Secretary of Environmental Affairs. It consists of approximately 30 members (appointed by the Secretary) representing a full range of community partners, including the environmental community, watershed associations, businesses, business organizations, regional planning agencies, municipal governments, scientists, educators, and citizens. The responsibilities of the WISC include:

- Providing on-going program development advice and guidance.
- Evaluating state agency and watershed level implementation progress.
- Identifying financial and technical resources for groups working in watersheds.

- Measuring progress and success, and reporting on this progress and success to the Secretary and the Massachusetts Watershed Coalition (the statewide association of watershed groups.
- Assessing proposals from watersheds for assistance in implementing watershed management.
- Ensuring that Watershed Action Plans satisfy established criteria for content, stakeholder involvement, and public review.

Integration of Watershed Management Resource Programs

The Watershed Initiative is structured to coordinate various state agencies and programs to work with local community partners to develop a comprehensive watershed approach based on the specific needs and issues in each of the 27 major watersheds in the State. The structure and process outlined below encompasses a comprehensive planning approach that included outreach, research, assessment, planning, implementation and evaluation. These watershed plans have the potential to address the full range of watershed issues, including water supply planning, water quality restoration and protection, wetland restoration, open space planning, habitat protection and enhancement and regulatory activities. The key for state agencies is to have the program be comprised of the core environmental programs of the agencies, rather than be a program that is outside of these agencies' core activities. The goal is to find more effective ways for agencies to accomplish their core activities. To date, the Initiative has succeeded in redirecting and reorganizing state agencies and divisions to provide services in ways that meet the needs of the state's 27 watersheds.

The Structure: EOEA Watershed Teams, representing state and federal agencies and community partners, form the basis of the state's watershed protection efforts by providing a direct watershed-specific link for community participation. The Teams perform watershed-wide water quality and habitat assessments and assist Stream Teams in their data and information gathering. The Watershed Teams also assist watersheds in overall planning and implementation through the development of Annual Work Plans and Five-Year Watershed Action Plans. The Team is equally accountable to the Secretary of Environmental Affairs and to the community for the plans as well as the products and deliverables identified in the plan.

The Watershed Management Methodology involves the creation of **Watershed Community Councils** in each of the state's watersheds. Councils will be composed of watershed partners who coordinate with teams to implement the watershed approach through identifying priority issues and developing and implementing Watershed Action Plans. The Watershed Community Council is representative of all interests in the watersheds including municipalities, businesses, landowners, citizen groups, and recreational users. The Watershed Community Councils also include representatives of state and federal agencies which have programs or activities in the watersheds.

In each Watershed, an organization or group, the Watershed Convener, assists a watershed in the formation of the Watershed Community Council. The convener is often the local watershed association. Conveners are existing organizations working in the watershed and are self-selected. They should be supported by the various partners in the watershed. Examples of potential conveners in addition to watershed associations are business councils, regional planning agencies, or other groups or partnerships serving the watershed with proven capability to support the Watershed Community Council and the planning process.

In addition to the Watershed Community Councils, sub-watershed Stream Teams, groups organized at the sub-watershed level, assess the quality of the local environment (through water quality monitoring and shoreline surveys of river or stream segments), identify local problems, and recommend solutions. Stream Teams include in their membership municipal government and business representatives who contribute to the assessment of problems and development of solutions. Information and recommendations are compiled by Stream Teams in Sub-watershed Action Plans for integration into the Watershed Action Plan. Stream Teams receive support and assistance through the Watershed Community Councils.

Sound and consistent science and technology is needed to support watershed activities. Consistent technical assistance and standards and protocols must be available to agencies, watershed teams, and community partners. To make sound environmental decisions, a Science and Technology Center and regional GIS Service Centers are being developed. Together, they are expected to provide practical accessible data from and to agencies and volunteer monitors working in the watersheds. Private consultants and academics have expressed interest in

developing a partnership among government, business, watershed, and academic interests to share data and coordinate technical services as a public/private partnership.

An interagency Roundtable has been established to coordinate resource allocation and set priorities for the EOEA agencies. It consists of senior EOEA agency managers. Roundtable members review annual work plans and comprehensive five-year watershed action plans. The Roundtable is expected to resolve resource allocation issues and ensure that subsequent decisions facilitate implementation of work plans. They work to ensure consistency of services and reconcile competing demands for resources. Finally, the Roundtable is expected to resolve deadlocked issues of resource allocation and ensure that subsequent decisions facilitate implementation of work plans. Community partners are represented through three seats on the Roundtable filled from the WISC Executive Committee so that community partners contribute to the development and implementation of work plans. Annual Work Plans and Watershed Action Plans will be linked to the legislative and agency budgeting cycle.

The Key Operational Elements Include:

- Each of the 27 watersheds has a watershed team led by one of 20 full-time team leaders. These team leaders work for the Executive Office of Environmental Affairs so that they serve as true interagency leaders to avoid turf barriers by being associated with one agency.

- The team leaders are managed by a high level watershed manager. The watershed manager not only manages the leaders, but has direct-interaction with the Commissioners of each agency and with the Secretary of Environmental Affairs to ensure support from the top.

- The Roundtable is the key mechanism to ensure.that agencies are allocating their resources, both people and money, according to the priority issues and actions identified by the teams.

- These elements are structured so that the teams, through the team leaders and the manager, have direct access to the Secretary and the Commissioners. Resource needs are communicated and addressed directly, by-passing the many layers of bureaucracy that stand between our front line staff and communities and the ultimate decision makers.

- Once resource allocations are recommended by the Commissioners and approved by the Secretary, they are implemented through the normal chain of command. In this way, all of the middle managers and front-line supervisors are responsible for seeing to it that these commitments are met. The watershed activities are part of their job descriptions, not outside of it.

- The five year and annual work plans developed by the teams serve as the "contracts" among the partners that allow the various work tasks to get done and allow the normal chain of command within the state agencies to implement the team priorities and actions.

The Process: The Watershed Initiative is based on a Five Year Planning Cycle that is designed to collect and share watershed resource information, assess impacts to water resources, and develop and implement activities to protect and improve them. Each year builds on previous years. Massachusetts' watersheds are in different years/phases of their planning cycle so that adequate state resources are available for each watershed. The phased five year cyclical program consists of:

YEAR/PHASE ONE: INITIAL OUTREACH

Determine what information is available, what is needed, and how it is obtained. Conduct outreach to gain community involvement, learn concerns and begin to develop priorities for action.

YEAR/PHASE TWO: RESEARCH

Fill in information gaps; conduct monitoring, review information, including input from watershed interests. Continue outreach to increase community involvement.

YEAR/PHASE THREE: ASSESSMENT

Assess current conditions and uses, determine causes and sources of impairment; develop solutions to immediate problems. Review data together with watershed interests, set priorities, provide grant information.

YEAR/PHASE FOUR:, PLANNING AND IMPLEMENTATION

Develop and implement solutions, solicit grant proposals, prepare plans to mitigate watershed problems; provide technical support. Include watershed interests in all facets of planning and implementation.

YEAR/PHASE FIVE: IMPLEMENTATION AND EVALUATION

Evaluate Watershed Team activities; update information, make changes for next cycle, continue implementation together with watershed interests.

Annual Work Plans are developed by each watershed team and serve as a guide for coordinating team work efforts of a given year. They are the building blocks of the Five Year Watershed Action Plan and provide the basis of resource requests to the Roundtable.

Each annual work plan is organized by the Watershed Initiative's goals (outreach and education, local capacity building, water quality, water quantity, habitat, open space, and recreation). The work plan lists tasks for team members (both agency and non-agency), identifies the cost of implementation (e.g., funding, personnel costs/time commitment), and contains a proposed schedule of activities for the period of the work plan. The Annual Work Plans are to be the basis of regulatory decision making.

To ensure accountability for agencies and community partners, the annual work plans include a Partnership Agreement signed by agency commissioners and other partners identified as having responsibility for completing actions identified in the plan. All partners accept responsibility through annual work plans.

Five Year Watershed Action Plans serve as working guidance documents that outline strategies to mitigate watershed problems and protect resources. Each of the partners in the watershed process bring their action items to the plan. The Watershed Action Plans provide the framework for cooperative efforts to protect and restore the natural resources of the watershed. They describe and prioritize environmental problems in the watershed, identify alternative technologies, specify structural and nonstructural solutions, describe sources of funding and technical assistance, make recommendations for regulatory decisions and specify a funding plan and schedule for completing actions. Most importantly, Watershed Action Plans assign roles and responsibilities for implementing the actions among the various stakeholders, within and outside the watershed, and designate lead persons or organizations. The Five-Year Watershed Action Plan forms the basis of regulatory decision making. The plans are submitted to federal, state, and local agencies to guide their decision making and allocation of funds and technical assistance.

Integrating Existing Environmental Programs Into the Structure and Process

Each agency and program continues to work to ensure that it is integrated with the Watershed Approach.

Some examples include:

- DEP Reorganization - in 1996 DEP underwent a major reorganization to build its structure on a watershed approach. Key features of the reorganization include delegating key environmental decisions to regional

offices with better understanding of watershed issues and organization of regional offices into watershed units consisting of members of multiple program staff.

- State revolving loan funds - to get on our intended use plan, the largest number of points in the ranking system is consistency with a state watershed plan. While we have struggled to get communities to find the relevance of the watershed approach before, now they are knocking on our door to find out what's in the watershed plan. In addition, the SRF eligibility has been broadened to include non-point source pollution so that the funds are available to address a wider variety of watershed issues. In 1997 the fund provided $207 million in 0% loans.

- State grant programs - all water related grant programs include ranking criteria for the consistency of the proposal with watershed plans or team activities. Therefore, our 319, 604(b), growth planning, CZM, land acquisition and other programs award funds based on watershed priorities.

- State regulatory programs - NPDES, water withdrawal, groundwater discharge permits - all are issued during the year four of the watershed cycle and allows for comprehensive evaluation and decision-making.

- Rivers Protection Act - An act passed in 1996 that establishes strict performance standards for all activities that occur within 200 feet of rivers and streams. The passage of this act was due in part to the concerted efforts of watershed advocates.

- TMDL - Total Maximum Daily Load (TMDL) analysis needs are prioritized by the watershed teams. Teams can help with the data development process and review the assessment process. Finally, teams will develop the implementation activities needed to have waterbodies meet state water quality standards.

- Environmental assessments - can involve a greater range of parameters as all agencies and community partners can participate and bring relevant information to bear.

- Monitoring and field work - great efficiencies by coordinating state and NGO personnel available to perform field work. Avoids duplication between agencies.

- Cross-media inspections and hazardous waste site audits are being integrated into the five year basin cycle and are being driven by watershed priorities

STATE PROGRAMS TO FOSTER THE ESTABLISHMENT OF GRASSROOTS AND WATERSHED BASED STEWARDSHIP ORGANIZATIONS

The Commonwealth of Massachusetts provides financial and other support to build local grassroots organizations that are focused on watershed protection issues. Each of the 27 watersheds have one or more groups currently dedicated to these issues, though they encompass a wide range of abilities.

Massachusetts Watershed Initiative Grant Program

Funding for the Massachusetts Watershed Initiative has been provided under the Open Space Bond fund. These funds have been used to develop two grant programs to support watershed organizations to participate in the Watershed Initiative.

Capacity Building Grants

Under the Capacity Building Grant the Executive Office of Environmental Affairs (EOEA) enters into contracts with organizations capable of working with EOEA- Watershed Teams and with watershed organizations that will work to create and implement a watershed action plan. The objective is to strengthen the long term capability of these organizations to participate in resource protection, help engage a diverse group of stakeholders, and work with EOEA Watershed Teams. The program is aimed primarily at building sustainable organizations by funding start-up operational expenses.

Communities Connected by Water Planning Grants

The Massachusetts Executive Office of Environmental Affairs (EOEA) enters into contracts for the development of a plan dedicated to effective growth planning integrated with comprehensive natural resource protection. This offering is made in two components. Part 1 is directed toward watershed associations, civic organizations, or other similar entities which meet the eligibility requirements enunciated below. Part 2 is directed toward municipal government, or a collaboration of neighboring municipal governments, or a regional planning agency, or similar government body.

Development of this plan is to be coordinated, assuring consistent objectives, and accepted by a broad cross section of watershed stakeholders. In conjunction with the development of these plans, respondents should include projects to:

- Identify and prioritize priority pollution sources;

- Organize the watershed community or segment thereof in support of implementation of 'recommendations;

- Create a formal procedure for watershed stakeholders to maintain open communications both with each other as well as the various government agencies supporting resource and growth planning efforts;

- Utilize the above procedure to tracking progress on the implementation of the recommendations put forward for resource protection and growth planning.

Other EOEA Programs that Support Grassroots and Watershed Organizations

Department of Fisheries and Wildlife Riverways Program - promotes the restoration and protection of the ecological integrity of watersheds. The program is designed to encourage and support local river protection initiatives. They accomplish this through:

- Providing technical assistance and outreach to communities, citizen groups and others;

- Assisting watershed organizations in developing “adopt-a-stream,” fish-way stewardship teams and other citizen initiatives;

- Preparing and distributing newsletters, brochures and "how to" publications;
- Conducting training sessions on conservation tools and action plan formulation;
- Disseminating notices of permit reviews and other pending government actions to citizen groups and providing guidance on how to participate in government decision making;
- Assisting communities in drafting river protection bylaws and ordinances;
- Formulating and promoting statewide policies and legislation on river protection;
- Negotiating donation of land and conservation restrictions;
- Providing grants to municipalities, regional planning authorities and watershed associations to improve public access to and along rivers;
- Helping communities clean up blighted urban riverbanks through the Massachusetts Urban Rivers Action Program;

Coastal Zone Management Monitoring Program - Provides small grants and technical assistance to volunteer monitoring groups in coastal areas. This program is funded through funds provided by the legislature for coastal monitoring activities.

Volunteer Monitoring Program - For FY 1998 the legislature funded the EOEA proposal to develop a grant program for volunteer monitoring activities. The program will provide small grants to volunteer monitoring groups and will support a state-wide network of technical assistance providers. The goal of the program is to have an active group of volunteer monitors statewide and to ensure volunteer monitoring data is included in state and federal watershed assessment reports.

Massachusetts Watershed Coalition - The Watershed Coalition is a non-governmental organization that assists watershed organizations to build their organization capacity to act as advocates for watershed protection. Programs include training in strategic planning, board and membership development, environmental planning and protection. Though not a state program, the Coalition plays a key role in building grassroots organizations.

Massachusetts Environmental Trust - Using funds raised through special conservation automobile license plates, the Trust is an environmental, philanthropic organization that provides grants to grassroots, non-governmental organizations to raise awareness and protection of state waterways. The Trust has recently implemented a New Alliances grant program that aims to build alliances among groups that do not traditionally work together on solving environmental problems.

CONCLUSION

Together these programs provide substantial direct support to grassroots environmental organizations. In addition, the Watershed Team and Community Council provide a forum in which environmental organizations can participate in watershed planning and decision-making with state, federal, and local government.

II. MANAGEMENT PLAN APPROACH

A. STATE INSTITUTIONAL FRAMEWORK

The Division of Watershed Management (DWM) within the Bureau of Resource Protection (BRP) has been designated by the Commissioner of the Department of Environmental Protection (DEP) as the lead nonpoint source control agency. The Secretary of the Executive Office of Environmental Affairs (EOEA), which oversees several departments including the DEP (see Figure 2), has included the issue of nonpoint source pollution among the state-wide environmental priorities for 1993 and ensuing years.

The DWM recognizes and acknowledges the fact that the successful implementation of the NPS Management Plan requires coordination and cooperation with appropriate agencies on the federal, state, regional and local level. This program coordination and cooperation has been incorporated into the core NPS Program described in Volume I of this plan. Subsequent sections in this Volume II will further describe and detail agency cooperation as it relates to other NPS related programs and activities, especially in the Coastal Nonpoint Pollution Control Program addendum.

B. NONPOINT SOURCE ADVISORY COMMITTEE

Since the inception of the Nonpoint Source Program in 1987 there has existed a Nonpoint Source Advisory Committee. With the on-going implementation of the Massachusetts Watershed Initiative the role of the Advisory Committee has diminished as the outreach and public involvement within each watershed has increased. The natural evolution of the Watershed Initiative has placed increased emphasis on individual watershed planning and implementation of the Nonpoint Source Program. The function and structure of this process is described in Volume II as well as the previous section of this volume (Section I.F.)

The Massachusetts Watershed Initiative has an oversight group called the Watershed Initiative Steering Committee (WISC) which functions as a task force and advisory group to all 27 watershed teams. The WISC is composed of representatives from a diverse private and public perspective that provide broad-based public input to the Watershed Initiative.

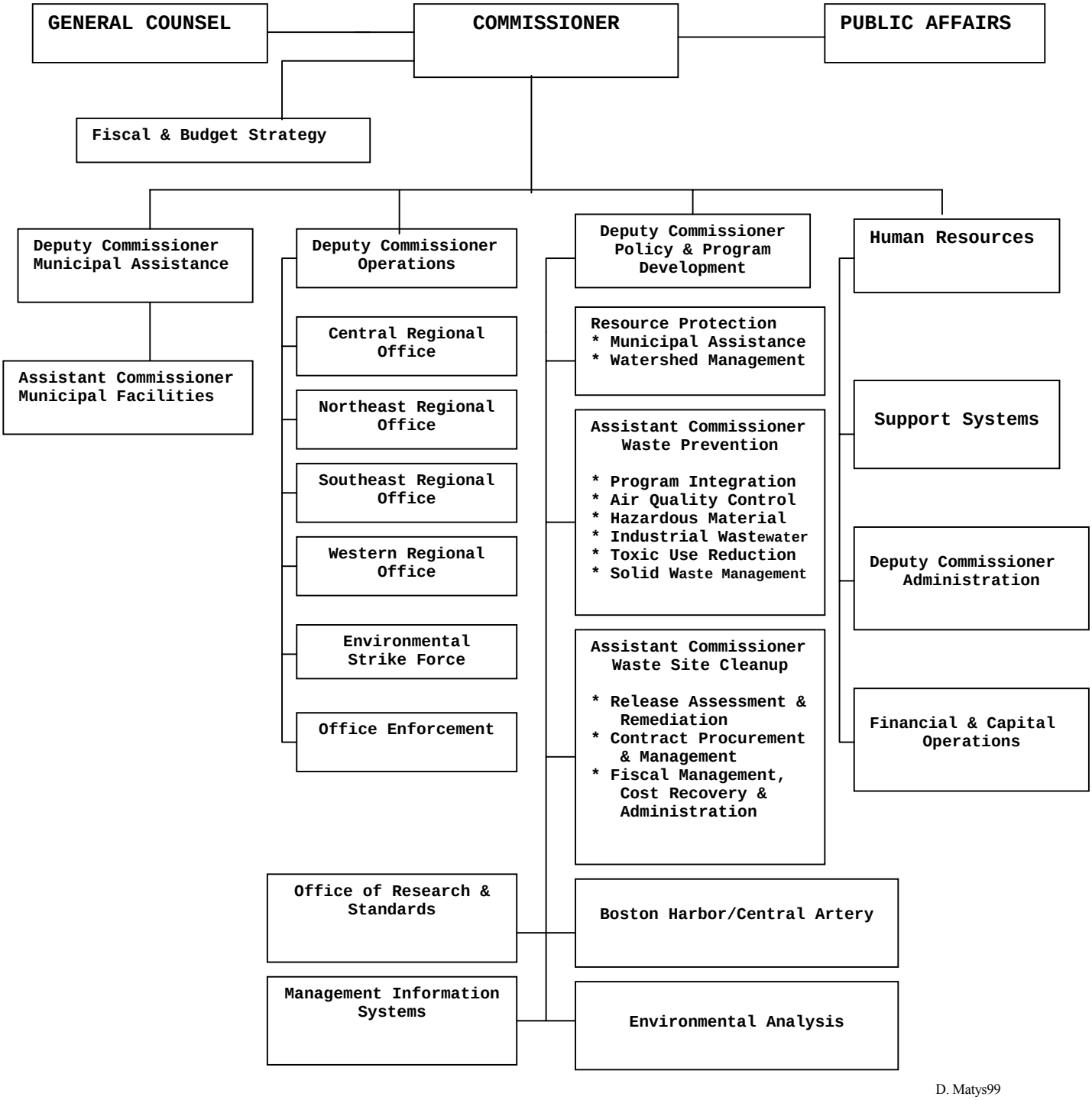
Central to the Watershed Initiative concept was a shift from top-down environmental management to a bottoms-up approach that actively engages local governments, citizens, business and other community partners in preventing and restoring environmental problems in their own communities. Each would be full partners in prioritizing needs. Thus the watershed teams constantly interface with local groups to discuss and address local issues.

C. ASSESSMENT REPORT

The state is required to update the original NPS Assessment Report (1988) in order to identify the major categories and subcategories of NPS pollution which continue to cause significant impairments or threats to the state's waters. The updated NPS Assessment Report should also include the identification of those waterbodies on a basin or watershed basis, which do not or are not expected to attain or maintain identified uses or meet water quality standards or goals without additional actions to control NPS pollution. Further, the updated Assessment Report should identify those outstanding resource waters which are expected to be threatened as a result of anticipated future land use changes. The assessment should include both surface and groundwater.

FIGURE 2

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION



In fulfillment of this requirement the most recent edition of the Commonwealth of Massachusetts Summary of Water Quality is hereby submitted as Appendix B. There are several reports of the summary of water quality submitted:

1. Summary of Water Quality (2 Reports)

These reports contain the state's water quality update for 31 drainage basins which appear in alphabetical order by basin name. Each summary contains a basin map and a listing of the specific river or marine water segments. Each segment has 7 specific elements defined as follows:

a) Waterbody Name: Specific river or marine water name. Waterbody names are followed by its individual identification system codes.

b) Water Segment Description: A description of the specific river or marine water segment. The description is prefaced by the individual Waterbody System identifier.

c) Size: Total size of an individual river segment in linear miles (mi), or marine water in square miles (mi^2). A "*" next to a size indicates a gross estimate in size and should be used accordingly.

d) Class: Water use classification. Freshwater rivers are classified A,B, or C, and are further divided into cold water fishery (CWF) or warm water fishery (WWF). Coastal and marine waters are classified SA, SB, or SC. See the Massachusetts Surface Water quality standards (314 CMR 4.00) for further criteria and definitions.

e) Status: An indication of an individual segment's level of designated use support. Specific codes are listed below:

S = All designated uses supported.
S/T = All designated uses supported, one or more uses threatened.
PS = Partially supporting one or more designated uses.
NS = Not supporting one or more designated uses.
NA = Not assessed.

f) Causes: Those parameters which cause non-attainment of designated uses.

g) Sources: Sources of non-attainment of designated uses (i.e., wastewater discharges or anthropogenic inputs).

Note: Causes and sources of non-attainment are listed for each segment. The irregular spacing is an artifact of data processing and does not indicate a link between cause and source.

2. Outstanding Resource Waters

These reports include an identification of the outstanding resource waters (ORW) and any known threats to their water quality. (See "Designated Outstanding Resource Waters of Mass. 1995).

This information has been entered into the EOEA GIS system and GIS map series covering the entire state are available for distribution.

3. Lakes and Ponds

For lakes and ponds impacted by nonpoint source pollution there is submitted in Appendix B the so-called state-wide list of 303(d) waterbodies. This list includes those waterbodies in the state which do not or are not expected to meet the water quality standards. In Massachusetts a preponderance of the listed waterbodies are lakes and ponds which are impacted by nonpoint source pollution. Those waterbodies appearing on the

303(d) list will be subjected to the TMDL process. Corrective measures to achieve and maintain beneficial uses of water will then be implemented by the watershed teams.

At this time there has been limited analysis conducted on the 305(b) report concerning the water quality impacts of nonpoint source categories of pollution. One analysis that has been conducted, however, concerns impacts by on-site wastewater systems. The following (Table 1) is a breakdown of the assessed surface waters which were cited in the 305(b) report as being impacted by on-site wastewater systems. There are a number of caveats that should be applied when interpreting this data.

a) A small percentage of the Commonwealth's surface waters were assessed for the 305(b) report. Twenty percent (20%) of the Commonwealth's approximately 8000 river miles were assessed for the report. This 20% does include all the principal mainstream rivers, and all known point sources of pollution, all major urban areas, and other areas of suspected pollution. In addition, 324 of the Commonwealth's 2871 lakes and ponds and 223 square miles of marine waters were assessed for the report.

b) The assessment was done by two different methods. Waters are considered as "evaluated" if the monitoring data for the water was more than five years old or if the assessment was based on information other than monitoring data. This information would include such things as land use patterns, predictive modelling, location of sources of pollution, etc. In "monitored" waters the assessment is made by comparing the data collected with the criteria specifically designated in the water quality standards. A breakdown of the evaluated waters versus the monitored waters is found on page 25 of the 305(b) report.

c) Since discharges from failing septic systems are usually not specifically monitored during river and marine surveys, this cited source should be considered an evaluated assessment by the basin planner. In the case of lakes, the source of a pollutant would be addressed in the Phase I diagnostic report, rather than during the water quality monitoring.

d) Septic systems are cited in the 305(b) as the source of non attainment for 12.6% of the total river miles assessed, 6.4% of the total lake acres assessed, and 6.6% of the total marine square miles assessed. These total percentages should be considered low for the following reasons:

    1) Since failing septic systems are generally isolated nonpoint sources of pollution the impact from these failing systems may not be found during the traditional monitoring surveys, which generally focus on point sources of pollution, major urban areas, etc.

    2) Only a small number (97) of the assessed lakes have had Phase I reports developed. The percentage of lakes with Phase I reports that were found to be impacted by failing septic systems is 13%.

The Assessment Report identifies urban runoff and land disposal as the major nonpoint source categories causing water quality impairments. Furthermore, the major nonpoint source subcategory for urban runoff is surface runoff and the major subcategory for land disposal is septic systems. For an identification of the best management practices (BMP's) to be applied to reduce the loadings resulting from each category, subcategory, or particular nonpoint source identified in the Assessment Report the reader is referred to the "Massachusetts Nonpoint Source Management Manual - The Megamanual" which is hereby referenced as an adjunct document to the Management Plan.

TABLE 1

BREAKDOWN OF SURFACE WATERS IMPACTED BY SEPTIC SYSTEMS FROM 305(b) DATA

BASIN	TOTAL AREA ASSESSED	AREA IMPACTED BY SEPTIC SYSTEMS	PERCENT OF TOTAL AREA IMPACTED
MARINE WATERS	(SQ. MI)	(SQ. MI)	
Mount Hope Bay	5.00	1.00	20%
Taunton	7.88	0.68	9%
Ipswich	0.40	0.40	100%
North Shore	34.02	1.89	6%
South Shore	20.66	3.43	17%
Buzzards Bay	28.10	4.44	17%
Cape Cod	31.73	2.03	6%
Islands	24.11	0.57	2%
RIVERS	**(MI)**	**(MI)**	
Hoosic	59.10	11.10	19%
Housatonic	80.50	60.20	75%
Westfield	106.00	20.70	20%
Deerfield	102.45	13.30	13%
Connecticut	148.45	2.30	2%
Millers	53.20	2.00	4%
Quinebaug	119.40	4.90	4%
French	37.90	3.70	10%
Blackstone	36.20	11.00	30%
Mount Hope Bay	2.90	0.60	21%
Charles	90.80	4.10	5%
Neponset	27.80	21.60	78%
Weymouth/Weir	33.20	17.90	54%
Nashua	84.95	4.00	5%
Concord	98.80	7.00	7%

TABLE 1 (Continued)

BREAKDOWN OF SURFACE WATERS IMPACTED BY SEPTIC SYSTEMS FROM 305(b) DATA

BASIN	TOTAL AREA ASSESSED	AREA IMPACTED BY SEPTIC SYSTEMS	PERCENT OF TOTAL AREA IMPACTED
Merrimack	100.60	6.40	6%
North Shore	17.40	9.40	54%
South Shore	25.00	5.30	21%
Buzzards Bay	41.50	26.80	65%
LAKES	(ACRES)	(ACRES)	
Arcadia Lake	40.00	40.00	100%
Walker Pond	103.00	103.00	100%
Lake Winthrop	102.00	102.00	100%
Lake Holbrook	36.60	36.60	100%
Lake Shirley	354.00	354.00	100%
Boons Pond	163.00	163.00	100%
Chauncy Lake	175.00	175.00	100%
Dudley Pond	84.00	84.00	100%
Long Pond	166.00	166.00	100%
Chebacco Lake	123.50	123.50	100%
Lake Elizabeth	8.90	8.90	100%
Herring Pond	42.70	42.70	100%
Red Lily Pond	4.40	4.40	100%

III. MASSACHUSETTS GROUNDWATER STRATEGY

A. SOURCE PROTECTION STRATEGY

Massachusetts has developed a Source Water Protection Program aimed at achieving consistent protection of ground and surface water sources of public drinking water. EPA approved Massachusetts' "Comprehensive Source Water/Ground Water Protection Program" on September 25, 1995. The cornerstone of both of these efforts has been an attempt to identify gaps and inconsistencies in protection and establish a schedule for addressing those gaps.

Massachusetts has been very successful in providing enhanced protection to identified priority water resource protection areas. The Waste Site Cleanup program, Title 5 governing septic systems, solid waste, and the Pesticide Program are particularly notable in their enhanced protection of priority water supply protection areas. The Drinking Water Program (DWP) also ensures groundwater supply protection through a combination of technical assistance to water suppliers and local officials, monitoring waivers and other incentives, grant programs, and regulatory requirements. Systems proposing large new wells, for example, must delineate the well recharge area, or Zone II, and adopt local regulatory controls meeting DEP criteria within those areas.

SOURCE WATER ASSESSMENT

The federal Safe Drinking Water Act Amendments of 1996 established the Source Water Assessment Program (SWAP). SWAP requires states to:

1. Delineate protection areas for all public ground and surface water sources;
2. inventory land-uses in these areas;
3. determine the susceptibility of water supplies to contamination from these sources;
4. publicize the results; and
5. establish technical and citizens' advisory committees.

Massachusetts will complete the 3000 assessments for all public water supply sources in the state and make the results available to the public prior to the May, 20003 deadline. The Massachusetts Geographic Information System (GIS) which combines computerized mapping and data manipulation and display capabilities will be integral to the state's approach. Data verification is currently underway and a number of new datalayers are being added to the state system. The state's focus will be on land-uses within the recharge areas and staff will provide significant technical assistance to accompany the assessment findings and to ensure that the assessments lead to drinking water protection improvements.

The first steps in SWAP are to verify drinking water supply source locations on GIS, to calculate accurate IWPA radii for small wells which previously used default radii, and to delineate Zone IIs for 190 wells by July 2000 and another 30-40 Zone IIs by July 2002. Mapping of confined aquifer units on GIS has recently been completed

B. STATE GROUNDWATER PROGRAM

1. Clean Water Strategy and Groundwater

Groundwater in Massachusetts has always been an important component of the state's water resources. The Department's Clean Water Strategy clearly identifies groundwater as an integral part of the overall strategy to protect and restore the state's water resources. Specifically, the Clean Water Strategy states that:

- Water resources should be protected to ensure that the state's existing and potential public drinking water supplies do not present adverse health risks and are preserved for future generations.

- Water resources should be protected to ensure groundwaters that are closely connected hydrologically to surface waters do not interfere with the attainment of surface water quality standards, which are necessary to protect the integrity of associated ecosystems.

As described in Volume I of this Management Plan, river basins are the basic planning unit for focusing and integrating water resource protection programs. The Bureau of Resource Protection's monitoring, permitting, compliance, enforcement and public outreach programs will be coordinated within river basins, which will be examined in depth every five years. Throughout Volume I of this Management Plan groundwater is explicitly identified as an important water resource which will be included in the watershed work in each basin. In addition to this basin-by-basin approach to setting and addressing water resource priorities (including groundwater) there is, of course the Bureau's on-going Water Supply Program. For a full description of this program the reader is referred to the chapter on long-term strategies, Section E: Public Water Supply.

2. Groundwater Prioritization

In Massachusetts wellhead protection areas are the highest priority groundwater areas. These include DEP approved Zone IIs as well as Interim Wellhead Protection Areas (IWPAs) for all public supply wells that lack Zone IIs. Because of the need to respond to threatened public water supplies, the Department does not prioritize its groundwater areas by basin.

The second highest priority groundwater areas are those dependent on private well supplies (i.e., those areas with a public water system distribution line more than 500 feet away) and areas with potential productive aquifers. Potential productive aquifers are those areas identified by the United States Geological Survey (USGS) as capable of producing high or medium yields of groundwater. The department will soon begin digitizing potential productive aquifer areas on the Mass GIS System.

A third tier of groundwater priority includes those groundwaters within Areas of Critical Environmental Concern (ACECs), those within identified habitats of endangered, threatened or special concern species, those within protected open space and natural areas, and those groundwaters feeding sensitive embayments.

3. Mapping of Groundwater Priority Areas

The Clean Water Strategy identifies the Mass GIS system as the key tool utilized in the Department to map, display, and coordinate information dissemination on priority water resource areas in the state. Most of the above mentioned groundwater priority areas currently exist on the Mass GIS system. Each DWM team assigned to the 27 major river basins will have access to these maps in order to help plan and prioritize their watershed work.

The Mass GIS groundwater related maps are understandably dynamic and in need of updating on an on-going basis. As emphasized in the Clean Water Strategy, the Department, through its BRP, has placed a high priority on ensuring that the mapping is complete and current. As stated in the Clean Water Strategy, "This effort will augment DEP's current policies, which recognize Zone IIs of public water supply wells and Outstanding Resource Waters (e.g., designated ACECs, certified vernal pools and surface drinking water supplies) as the highest priority water resources in the Commonwealth."

4. Interconnection With Surface Water

Any discussion of groundwater priority areas within Massachusetts must take into account the fact that groundwater and surface water in the state are intimately interconnected. The state has an abundance of extremely shallow aquifers and there are numerous groundwater - surface water interconnections. The USGS has noted that groundwater in the state is mainly recharged by precipitation and then gradually discharges to waterbodies. The inter-relationships between surface and groundwater is of great importance in both regional and local hydrologic situations, and a wide variety of information can be obtained by analyzing stream flow data. Evaluation

of the groundwater component of stream flow can provide important and useful information regarding regional recharge rates, aquifer characteristics, groundwater quality, and indicate areas of high potential yield to wells.

In terms of practical applications regarding nonpoint source pollution controls, the close interrelationship between surface and groundwater must be taken into account. Best Management Practices (BMPs) must be evaluated for their impact on both surface and groundwater in relation to their geographic location. The Department actively seeks management strategies that yield multiple benefits such as the protection of both surface and groundwater.

5. Priority Categories/Subcategories of Nonpoint Source Pollution that Threaten Groundwater

The Department has determined that the following list comprises the priority sources of NPS pollution impacting groundwater in Massachusetts:

CATEGORY	SUBCATEGORY	RANKING
Land Disposal	Septic System	High
	Sludge/Septage	High
	Landfills	High
	Hazardous Waste	High
Urban Runoff	Surface Runoff	Medium
Agriculture	Pesticides	Medium
	Fertilizers	Medium
	All Others	Low
Storage Tank Leaks	Petroleum Products	High
Highway Maintenance and Runoff	Road Salt	Medium
Resource Extraction	Surface Mining (Sand/Gravel)	Medium
Silviculture	All	Low
Construction	Land Development (Erosion/Sedimentation)	Low

A continuing concern in every watershed is nonpoint source pollution from land use and growth issues which may impact groundwater. As housing developments continue to be constructed and bigger and better shopping areas compete for space there is a need to ensure that such growth is implemented responsibly. Best management practices must be included to prevent and control nonpoint source pollution. This management plan addresses this (or these) issue(s) principally in Chapter VI, Long-Term Strategies.

A second strategy is outlined in Volume I of the Management Plan which describes the comprehensive outreach program to be implemented as part of the OWM activities by each watershed team. Land use issues, development and best management practices will be high on the agenda of each watershed team.

6. Implementation of Groundwater BMPs

The Department places a strong emphasis on working with local officials to guide them in adopting nonpoint source BMPs through bylaw adoption (aquifer protection zoning), board of health regulations and similar local actions. In the spirit of public participation, these are implemented through workshops (e.g., circuit riders), technical assistance, training seminars, outreach and guidance materials and related activities. Most of the technical assistance material is available at DEP's website (Http://www.state.ma.us/dep/) The Department targets these functions toward priority groundwater areas, especially wellhead protection areas for new public supply wells. This approach is consistent with the basic tenet for nonpoint source pollution control as outlined in Volume I of this Management Plan. Municipalities govern the use of land within their jurisdictions and thus they become the final implementor of BMPs within wellhead protection areas and other priority groundwater areas. The Department has regulatory authority within the Zone I areas (especially during new source approvals where ownership or control of the land is required) but often must rely on municipal compliance for most of the BMP implementation outside the Zone I delineations.

The Department plans to link its efforts to encourage local implementation of nonpoint source management controls to its Source Water Protection Project which is aimed at ensuring comprehensive, consistent protection of ground and surface water sources of public drinking water.

7. Nitrate Loading Analysis

Another major area of concern for groundwater is in the area of nitrate loading. To protect groundwater, the revised Sanitary Code Title 5 limits septic system discharges to 440 gpd/acre within Zone IIs and IWPAs. This program allows an alternative approach as long as anticipated nitrate levels stay below the planning goal of 5 mg/l at the public supply well. This requires that a sophisticated nitrate loading analysis be conducted. DEP is in the process of training local officials on the use of computerized nitrate loading model (developed with Section 319 monies). DEP plans to continue to focus on training local officials and on reviewing model applications. DEP is also planning to develop and conduct outreach on a similar nitrate loading model for nitrogen sensitive embayments. This work concerning nitrogen loading to groundwater will be closely coordinated with the Mass Bays Program and the Buzzards Bay Project. Both of these programs have a very strong commitment and very relevant experience with the complicated subject of nitrogen contamination of groundwater and coastal eutrophication. Their modeling expertise on this subject will be extremely useful to DEP in implementing the new nitrogen related aspects of Title 5.

The importance and public health concerns regarding elevated nitrate levels in groundwater are well known. In Massachusetts recent data on nitrate concentrations from 2,673 public supply well sampling locations tested from 1995 through 1998 indicated the following:

Number of GW or GW/SW Sampling Locations	Percentage	Highest Result at Location
15	0.6%	exceeded 10 mg/l standard
109	4.1%	exceeded 5 mg/l but less than or equal to 10
458	17.1%	exceeded 2 mg/1 but less than or equal to 5
2091	78.2%	less than or equal to 2 mg/l

Any concentration over 2 mg/l is considered within the "danger zone" and cause for concern. It is believed that the elevated nitrate levels are predominantly caused by septic (and cesspool) systems. These data lend strong support to the revised Title 5 and wellhead protection regulations that control subsurface sanitary discharges to 440 gpd/acre with the goal of limiting groundwater concentrations of nitrate nitrogen to 5 mg/l or less.

C. Action Plan: Short-Term and Long-Term Groundwater Goals

To summarize the various components of the Source Protection Strategy and the State Groundwater Program the following short-term and long-term goals are outlined below and should be considered elements of an Action Plan. Where appropriate, each goal will be followed by a reference to some other part of this Management Plan for more detailed information on that goal.

1. Short-Term Groundwater Goals

a) Implement Title 5 regulation [VI.A.; VI.D and VI.E.]

- In cooperation with Mass Bays Program, Buzzards Bay Project and a technical advisory committee develop and implement an approach and methodology to identify and protect nitrogen sensitive embayments.

- In cooperation with Mass Bays Program, Buzzards Bay Project and a technical advisory committee develop the necessary technical methodology (e.g., nitrogen loading models) to determine nitrogen inputs from various land uses. This task will likely involve modifications or adaptations of the "Nitrogen Management Strategy" developed by the Buzzards Bay Project.

- In cooperation with the Mass Bays Program, Buzzards Bay Project and a technical advisory committee explore the feasibility and usefulness of encouraging local regulations to require septic system design changes or setback requirements to prevent virus transport to coastal waters.

b) Improve water supply data and GIS information [VI.D. and App.A]

- Update/verify/correct groundwater resource data and water supply data in GIS; print and distribute maps to watershed teams and other entities.

- Calculate new IWPAs for small wells.

- Delineate Zone IIs for all wells greater than 100,000 gpd.

c) Develop Source Protection Strategy to protect water supplies from NPS pollution [III.A.]

d) Provide guidance to municipalities to protect groundwater from NPS pollution [Volume I; VI.D.]

- Coordinate outreach activities with the watershed teams to provide guidance and technical assistance to communities on methods of artificial recharge that do not degrade groundwater.

- Conduct training for local water suppliers; develop and disseminate outreach materials; review local bylaws.

e) Implement stormwater guidance/policy with other EOEA/DEP programs [IV.E.2.C. for Stormwater Management Manual] and outreach at local level.

f) Implement sludge/septage disposal guidance that reduces risk of impact on groundwater [IV.G.].

g) Assist Massachusetts Highway Department (MHD) to develop/implement BMPs for stormwater runoff from roads [VI.C.].

2. Long-Term Groundwater Goals

a) Implement the Source Protection Strategy [III.A.].

b) Complete municipal natural resource prioritization scheme and modify facility siting process.

c) Implement measures to reduce use of herbicides on Railroad right-of-ways and in priority sole source aquifers [VI.D.3.A.2. and VI.F].

d) Implement measures to reduce pesticide use within Zone IIs and IWPAs [VII.D.3.A.2]

e) Assist municipalities to enact and implement groundwater (aquifer) protection bylaws/ordinances [Volume I in general and VI.D.3.C.].

f) Complete trend analyses of groundwater quality by basin and determine impacts from NPS pollution. Share results with Watershed Teams for potential BMP implementation strategies.

g) Implement the Source Water Assessment Program (SWAP)

h) Monitor EPA's emerging Groundwater Rule and prepare to implement when finalized.

i) Provide financial assistance to public water suppliers or technical assistance providers to support improvements in the protection of public water supply sources.

IV. THE PLAN

A. PREFACE

This section of the Management Plan, Volume III, is a technical update of the original Section III, "THE PLAN". The present section of the updated plan will include current information regarding the various state programs that address major categories of NPS pollution. This information will be an update on laws, regulations, policies and any programmatic changes.

This section will also include a full update and any necessary revisions to the so-called long-term strategies (the original Section III. c. 1-7). A determined effort is being made here to avoid redundancy between this updated section and the addended Coastal NPS Plan. In all likelihood, however, there may be some unavoidable redundancy because the Coastal NPS Plan is being developed and written as a stand-alone document which must meet certain specified federal requirements. These requirements are, in part, very similar to the requirements of the present Section 319 NPS Management Plan.

There is also an effort to make this section of the plan more user friendly for the reader. The original plan, although comprehensive and chuck-full of information, was found to be somewhat unmanageable in terms of easy access to the information. It is hoped that the updated version lends itself to more efficient use by the reader.

B. SILVICULTURE

1. Nonpoint Source Background

Harvesting - almost all NPS silvicultural pollution results from the harvesting of wood products. Erosion is not caused by the cutting of trees, but from access and skid roads, stream crossings, and log landings. This can result in suspended or bed load sediments in streams, ponds, reservoirs, and lakes.

Clearcutting - clearcutting large areas may result in hydrologic modifications which could cause accelerated channel or sheet erosion.

Reforestation - site preparation may result in the temporary loss of cover and result in sheet and rill erosion. Use of herbicides to suppress existing vegetation may result in water contamination.

Christmas Tree Plantations - site preparation and annual weed control with herbicides may result in accelerated sheet and rill erosion and water contamination.

Harvesting Equipment - spillage and leakage of stored fuels or power equipment may result in water contamination.

2. Regulatory Background

A) Mass General Laws, Chapter 132 Forest Cutting Practices Act

The major mechanism for regulating forest cutting practices is contained in 304 CMR 11:00 which are statutorily authorized by M.G.L. Chapter 132, Sections 40-46. Together these sections are popularly called the "Cutting Practices Act." This regulatory mechanism does address the issue of nonpoint source pollution, although not by that name.

1) The owner of any woodland must develop, for approval, a complete cutting plan along with a notice of intent to cut to the Division of Forests and Parks of the Department of Environmental Management. Failure to submit a plan, or to follow it once approved, can result in a per acre fine.

2) The state (DEM) is responsible for approving the plan and inspecting the work to see that it is carried out properly.

3) A stop order may be issued if cutting is not in accordance with the plan or with accepted practice or if work is at variance with legal requirements.

4) In addition, timber harvesters must demonstrate familiarity with relevant laws before a license can be issued. The point being made here is that the present law and regulations can be effectively enforced.

The minimum forest cutting practice standards which appear in a land owner's plan must be followed while guidelines outline forest practices that, if followed, will further benefit both the owner and the public . It should be noted that once a guideline is in an approved plan it is legally binding on the land owner.

The relevant part of all this which directly pertains to nonpoint source controls is that the statute lists the forest values which contribute to the public interest. It is:

> "declared that the public welfare requires the rehabilitation, maintenance and protection of forest lands for the purpose of conserving water, preventing floods and soil erosion, improving the condition of wildlife and recreation, protecting and improving air and water quality, and providing a continuing and increasing supply of forest products..." (MGL, C.132, §40)

Perhaps even more importantly from a nonpoint source standpoint are the forest cutting practice standards set up by the state committee authorized under the act. The functional relationship between the forest and the values of interest are recognized:

> " 'Conserving Water,' 'preventing flood and erosion' and 'protecting water quality' all are closely related and much affected by the watershed functions of forest.''

The assessment report has shown that on a state-wide basis nonpoint source problems arising from silviculture are minimal. There are, however, certain localized areas where it is suspected as a problem. In furtherance of preventing NPS pollution from silvicultural activities the following changes are being contemplated:

1) ...A revision to the Rule and Regulations for this law is currently underway by the State Forestry Committee (appointed by the Governor) the Farmland Advisory Committee (appointed by the Governor) and the Division of Forests and Parks (DEM). This revision will involve NPS references, BMP references, better wetland identification, River Basin and Watershed Information.

2) ...Mandatory licensing of professional foresters has been signed into law, with rules and regulations under preparation. This will upgrade the quality of cutting plans submitted and work planned on the ground. It is not unreasonable to expect the required plans to be prepared by licensed professional foresters.

3) ...The Atlas of Estimated Habitats of Rare Wetland Wildlife Species is checked by DEM and any cutting plan showing habitat is forwarded to Natural Heritage for input. This is a policy agreed upon by DEM and DFW.

4) ...An in-house Training Committee, in cooperation with DEP, is developing programs and workshops for professional foresters and licensed timber harvesters. Changes are being considered for timber harvesting license procedures including: more thorough examination procedures, continuing educational requirements, and continuous license number.

5) ...Massachusetts Best Management Practices Timber Harvesting Water Quality Handbook was prepared for loggers and foresters, and workshops were held across the state to promote understanding of the BMP's contained in the booklet.

B) "GEIR Generic Environmental Impact Report: Forestland Management Practices, 1992"[1]

The original (1989) Management Plan described the initiation of a Generic Environmental Impact Report on the Forestland Management Practices Act. This important project has been completed and will result in significant changes in the state's forest cutting regulations.

The purpose of the Generic Environmental Impact Report (GEIR) is to update the Department of Environmental Management's (DEM's) 1980 EIR (EOEA #3114) on forest management practices and to explore the assumption that a threshold is needed within the Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00) because of potentially significant impacts of forest cutting practices on public surface water supplies. There are four specific project objectives:

1) To identify the potentially significant environmental impacts from forest management practices, especially those impacts associated with timber harvesting;

2) to describe available mitigation procedures for identified impacts and show how they are mitigated through two programs administered by the DEM, Division of Forests and Parks; the MGL Ch. 132 Minimum Forest Cutting Practices Act Program and the Stateland's Management Forestry Program;

3) to recommend administrative, regulatory or legislative changes needed to improve the above named DEM forestry programs;

4) to examine whether a threshold should be established for MGL Ch. 132 forest cutting permits for which a MEPA filing would be required.

While the MGL Ch. 132 forest cutting regulations apply to all forestland in Massachusetts, the Statelands Management Forestry Program is limited to forestland under the jurisdiction of the Division of Forests and Parks. These lands include state forests, parks, reservations and beaches. According to the 1985 USDA Forest Service inventory, Massachusetts is 64% forested with 3,255,200 acres of timberland (Dickson and McAfee, 1988). Currently, the state forest and park system comprises 268,728 acres of which approximately 75% is forested (More, 1985). Approximately 113,819,586 board feet of timber is harvested annually in Massachusetts (Dickson and McAfee, 1988) of which about 4.6% or 5,331,000 board feet are from the Division's properties (Mawson and Kling, 1988). MGL Ch. 132 forest harvesting plans account for 98,000,000 board feet or 86.5% of the USDA Forest Service estimate of yearly harvest (Mawson and Kling, 1988). Each program is discussed separately in the report.

---

[1] The following discussion is taken from the Final GEIR Forestland Management Practices, DEM, September, 1992.

SPECIAL PROJECT FOCUS

Special emphasis in the GEIR is given to water resources, especially stream crossings within one mile upstream of surface water reservoirs and wetlands. New data was gathered to assess impacts of forest management operations on these resources. This information will be used by MEPA to determine if a threshold concerning stream crossings undertaken as part of a MGL Ch. 132 forest cutting permit should be promulgated in the MEPA regulations under 301 CMR 11.26 (Review Thresholds for Permits). Section 8 under 11.26 is currently reserved for such an inclusion in the current regulations. Based on the results of this GEIR, the reserved section will be eliminated or a threshold promulgated.

PROJECT SUMMARY

The Department of Environmental Management (DEM), Division of Forests and Parks prepared this forestland management practices generic environmental impact report (GEIR). Executive Office of Environmental Affairs (EOEA) file #6307, to update the Division's 1980 EIR on forest management practices and to explore the assumption that a threshold within the Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00) is needed to protect public surface water supplies from potentially significant impacts of forest cutting practices. The project was initiated in 1986 and a Technical Advisory Committee (TAC) was formed to assist in the preparation of the GEIR. Attention is focused on two programs administered by DEM; the MGL Ch. 132 Forest Cutting Practices Permitting Program and the Statelands Management Forestry Program. The Ch. 132 permitting program regulates timber harvesting operations on both public and private land in Massachusetts while the Statelands Management Forestry Program administers harvesting operations only within the state forest and park system. The report is based on the Division's previous EIR, four TAC subcommittee reports, and extensive literature review and several consultant studies undertaken specifically for the GEIR. Funding for the special studies was provided by DEM and the Department of Environmental Protection's Bureau of Resource Protection.

Potentially significant impacts from forest management practices, especially timber harvesting, are examined for a number of environmental elements: soils, vegetation, wildlife, water, recreation, aesthetic and cultural resources, including effects on the physical, social and economic environment. Impact identification is based on criteria established through an examination of the concept of impact significance contained in the report. Available mitigation is also described for each impact with emphasis on how the impacts are mitigated through both previously cited forestry programs. Alternative management strategies are outlined for both programs and a variety of administrative, regulatory and legislative recommendations are made to strengthen the efficiency and effectiveness of each program.

Key findings of the GEIR include:

- ✔ Best Management Practices (BMP's) are the most effective way to mitigate potentially significant impacts to soil, water and wetland resources from timber harvesting activities. BMP's are incorporated in the Ch. 132 Forest Cutting Practices Act regulations (304 CMR 11.00).

- ✔ The Ch. 132 regulations cover virtually all harvesting operations in the state and provide effective control of potentially significant environmental impacts from forest management practices.

- ✔ Wetlands are not being harvested to a large extent under Ch. 132.

- ✔ By strengthening the Ch. 132 regulations, no threshold in the MEPA regulations is needed to further protect the Commonwealth's public water supplies from timber harvesting activities.

- ✔ The level of harvesting activity can be increased substantially in Massachusetts without incurring ecological damage.

Key recommendations of the GEIR include:

- ✔ Amend Ch. 132 regulations to require mitigation of all stream crossings with approved measures in accordance with specifications contained in the Massachusetts Best Management Practices Handbook. In addition, within 500 feet upstream from a public water supply a temporary bridge must be used for stream crossings unless mitigation with a culvert approved by the Director or his agent can be shown to be equally effective.

- ✔ Based on the GEIR report findings and the implementation of the Ch. 132 program recommendations contained in this report, a MEPA threshold is not necessary and the section currently reserved in the MEPA regulations 301 CMR 11:26(8) should be eliminated.

The Final GEIR is a major document which directly addresses nonpoint source pollution from silvicultural activities. The Secretary of Environmental Affairs reviewed the Final GEIR and on November 30, 1992, issued the following Certificate:

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
FINAL GENERIC ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Forestland Management Practices
PROJECT LOCATION:	State-wide
EOEA NUMBER:	1093, 3114 & 6307 - 1986 Update
PROJECT PROPONENT:	DEM, Division of Forest and parks
DATE NOTICED IN MONITOR:	October 22, 1992

The Secretary of Environmental Affairs herein issues a statement that the Final Generic Environmental Impact Report submitted on the above project adequately and properly complies with the Massachusetts Environmental Policy Act (G.L., c.30, s. 61-62H) and with its implementing regulations (301 CMR 11.00).

The GEIR addresses the management of state forestland and the Department of Environmental Management (DEM) permit program for harvesting wood products on private and public lands.

The GEIR has identified numerous requirements, recommendations and available mitigation to minimize the future environmental impacts of the DEM programs. These include changes in DEM laws, regulations and policies. In addition, the GEIR recommends that DEM consult and develop Memoranda of Understanding with a variety of agencies, including the Department of Environmental Protection, the Natural Heritage Program, the Massachusetts Historical Commission and the Department of Food and Agriculture. I am asking that the ENF for the next update of this GEIR be filed in January of 1995. The ENF should present the status of each of the proposed mitigation efforts, MOUs and consultations at that time.

The DEM planning under the GOALS program includes developing plans for lands in some designated ACECs. DEM has recommended in the GEIR that such areas be managed by a method known as "Integrated Management." I agree with this approach to plan for the management of resources in ACECs. I also note that ENFs must be filed for each planning effort involving ACECs, in accordance with 301 CMR 11.15(3)(b).

The GEIR has provided much useful information about the environmental impacts of forestry activities and about ways those impacts can be mitigated. The most significant remaining issue is whether review pursuant to MEPA should be required for any of those activities. As I will explain in this Certificate, I believe that MEPA review is appropriate, and therefore that review thresholds should be established, in two instances.

First, it is clear from data included in the report that stream crossings, when they are not accomplished by bridge, can have adverse effects on downstream water supplies, due to increases in turbidity. The use of portable bridges effectively eliminates those impacts.

I am pleased at DEM's conclusion that bridges should be required for all stream crossings within 500 feet upstream of a public surface water supply reservoir, but remain concerned about those projects where bridges will not be used. I also believe that the data supports a conclusion that water quality can be adversely affected 1000 feet downstream of the activity. Therefore, I believe that a MEPA threshold should be established for forestry activities requiring a permit under G.L. c. 132 where a non-bridged stream crossing is proposed 1000 feet or less upstream of a public surface water supply reservoir. In ACECs, I believe that an ENF should be filed for projects where the non-bridged crossing is within 1/2 mile upstream of the reservoir.

Second, I believe that MEPA review is appropriate for large clear cuts. DEM limits clear cuts to 5 acres when regeneration is seeding from surrounding tree stands, and 10 acres when the source of regeneration is advanced generation or seeding from harvested trees. Those limits can be exceeded when approved by a state forester if it is shown that environmental damage is less with a larger cut. However, the GEIR noted, "that DEM also feels that specific criteria for approving a larger cut needs to be established in the regulations to provide guidance to Service Foresters. These criteria should include the purpose of the cut, provisions necessary to ensure adequate regeneration, and measures needed to mitigate environmental impacts." While no projects now propose clear cuts of this magnitude, new uses of chipped wood and wood pellets, and new harvesting technology may make such proposals desirable. The MEPA review is needed to provide public review of such proposals. While DEM has determined that projects exceeding 5 and 10 acres require further analysis, most reviewers of the GEIR have suggested a threshold of 25 acres. I suggest that the threshold should be projects proposing to clear cut more than 25 acres. Within ACECs, a clear cut of one or more acres should require an ENF, unless the issue has been included in a resource management plan for the ACEC that has already been approved by DEM and reviewed through the MEPA process.

Following the issuance of this Certificate, I will confer with DEM to develop a Memorandum of Understanding and/or amendment to the MEPA regulations to establish these thresholds.

(SIGNED 11/30/92)

As a result of the Secretary's Certificate two actions have taken place:

First, a Memorandum of Understanding between the Secretary of Environmental Affairs and the Department of Environmental Management, Division of Forests and Parks has been entered into.

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE SECRETARY OF ENVIRONMENTAL AFFAIRS
AND
THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF FORESTS AND PARKS

WHEREAS, the Division of Forests and Parks within the Department of Environmental Management (hereafter DEM) is statutorily charged pursuant to G.L.c.132 with review and approval of proposed forest cutting plans; and

WHEREAS, the Secretary of Environmental Affairs (hereafter the Secretary) is statutorily charged pursuant to G.L.C.30, ss. 61-62H, with administering the environmental impact review process for projects requiring state approvals; and

WHEREAS, DEM prepared and submitted for public review and comment a Final Generic Environmental Impact Report (FGEIR) relative to forest cutting practices and policies and their impact on the environment; and

WHEREAS, the FGEIR provided much useful information on the impacts of forest practices on the environment and proposed numerous regulatory and policy changes the effect of which would be to minimize those impacts; and

WHEREAS, on November 30, 1992, the Secretary issued a Certificate approving the FGEIR as complying with the requirements of MEPA and determining that certain forestry activities would benefit from review pursuant to the Massachusetts Environmental Policy Act; and

WHEREAS, the MEPA regulations contemplate the issuance of Memoranda of Understanding relative to programs developed after the promulgation of the MEPA review thresholds, 301 CMR 11.03(8);

The Secretary and the DEM hereby enter into the following Memorandum of Understanding:

1. An Environmental Notification Form shall be filed and procedures in accordance with G.L.c.30, ss. 61-62H and 301 CMR 11.00 shall be followed prior to the issuance of a permit by DEM pursuant to G.L.c. 132, of forest harvesting activities where:

    a) A non-bridged stream crossing is proposed 1000 feet or less upstream of a public surface water supply reservoir. In an Area of Critical Environmental Concern (ACEC), an ENF shall be filed where a non-bridged stream crossing is proposed 2640 feet or less upstream of a public surface water supply reservoir.

    b) An ENF shall be required when a clear cut of 25 or more acres is proposed. In an ACEC, an ENF shall be required where a clear cut of one acre of more is proposed. On state-owned lands within an ACEC, an ENF shall not be required if clear cuts have been contemplated and evaluated in a resource management plan that has been prepared pursuant to 301 CMR 11.15(3)(b) and reviewed in accordance with MEPA regulations.

2. This MOU shall remain in effect until either the MEPA regulations are amended to incorporate a regulatory threshold for forest harvesting activities or until the signatories or the successors agree that the requirements of this MOU are no longer necessary to ensure that the environmental damage that may be caused by these activities will be avoided or minimized.

Second, the regulations covering forest cutting practices are currently being amended to address stream crossings upgradient of water supplies and areas of critical environmental concern (ACECs). These amended regulations are expected to be completed by early 1994. Also, the MEPA regulations are currently being amended to incorporate a regulation threshold for forest harvesting activities to provide for public review. The threshold will likely be 25 acres for clear-cutting except within ACEC's where the threshold will be one or more acres, unless the area is included in an approved resource management plan for the ACEC.

C.) Wetlands Exemption

The Massachusetts Wetland Protection Act, Chapter 131 of the Mass. General Laws, provides for silvicultural exemptions. These are currently under review (1993) and will be revised by way of clarification as part of the Governor's Farmland Advisory Committee process.

It is clear from the Nonpoint Source Assessment Report, GEIR, Stream Crossing Study, and over 50 years of watershed data, that nonpoint source pollution from forest harvesting operations is minimal in Massachusetts. Furthermore, it is clear that what problems do exist are being addressed by law, regulation, and education. However, there is considerable public resistance to forest harvesting in Massachusetts. Much of this arises from personal and local concerns such as aesthetics, noise, and traffic. Forestry agencies and the forestry professions are working to address these issues. It is important to keep the water quality problems in separate focus from these other concerns so they can be dealt with in a rational scientific manner.

Forest harvesting as a business is usually quite marginal. People in the harvesting business and the landowners who own the forest resource need to have clear, concise, practical, economic, and simple regulations to follow -- or they won't follow them! This needs to be kept in mind as the regulatory revisions are being pursued.

3. STRATEGY

The Watershed Initiative approach of the core Nonpoint Source Program described in Volume I will result in the identification of nonpoint source pollution problems within each basin. These nonpoint source pollution problems may affect surface water, groundwater or coastal waters. The strategy for silviculatural nonpoint source pollution problems will be as follows:

1. Watershed Teams should determine if the situation can and should be addressed through any other existing regulatory or non-regulatory program. If yes then coordinate with that program and agency to effectively address the problem.

2. If there is no other effective or meaningful programmatic solution then the nonpoint source pollution problem will be evaluated and prioritized for inclusion in the Team Watershed Management Plan. This evaluation and prioritization process is the same as that described in Volume I and will include the following information:

   - Water quality monitoring and assessment data from any reliable source.
   - Local and or regional information.
   - The total maximum daily load analysis and implementation plan.

C. AGRICULTURE

1. Nonpoint Source Background

* Irrigated/non-irrigated cropland - There are two major sources of potential surface and groundwater contamination from agricultural cropland consisting of nutrient and pesticide contamination.

  Nutrient contamination may result from the over application of inorganic (commercial fertilizers) and organic (manure) sources of nitrogen containing materials to the land surface. These nitrogen sources may contain large percentages of highly water soluble nitrogen compounds which have the potential to leach to groundwater. Conversely, less water soluble nitrogen compounds are subject to surface runoff into surface water bodies. Furthermore, cropland is subject to sheet, rill and gully erosion when surface runoff is not properly managed resulting in sediment deposition and phosphorus enrichment.

  Pesticide contamination may result from the use of products which are used to control a wide variety of pest problems. Prior pesticide leaching problems resulting from aldicarb, EDB, and 1,2-D no longer pose a future threat to groundwater since these pesticides are no longer used. Other pesticides may also impact groundwater, albeit with reduced potential. Current potential contaminants consist of herbicides which are used to control weeds in corn, but may also include insecticides and fungicides which are used on a variety of crops for numerous pests. Pesticides also have the potential to contaminate surface waters from erosion in the same manner as nutrients.

  Recently several corn herbicides have been detected in surface waters. However, these detections were observed in large agricultural states which have considerable amounts of agricultural lands within close proximity to surface waters. These detections have resulted in changes in the use directions for these products limiting their use rates and requiring buffer zones to the water body.

* Specialty Crops - Cranberries are a prime example of a specialty crop which may have direct impacts on surface waters. Due to the required cultural practices for growing cranberries, large amounts of water are used for irrigation, crop frost protection, and harvesting. The water used on cranberry bogs is typically obtained from surface waters in close proximity to the bogs. This water is normally drawn from the surface water body, utilized and retained as required, and returned to the water body. However, following pesticide applications cases of misuse, vandalism or accident have resulted in direct introduction of pesticides to surface waters.

  Another potential impact on surface water may result from the aerial application of pesticides to cranberry bogs. Due to the close proximity of cranberry bogs and surface waters pesticide drift may occur and result in direct input of low levels of pesticides to surface waters. The use of pesticides on cranberries is not considered to have any impacts on groundwater due to the nature and construction of cranberry bogs which must be able to contain water for production.

* Pasture land - Pollution of surface and groundwater may occur from overgrazing, grazing near waterways, removal of riparian vegetation, overstocking of pasture land resulting in the loss of cover, and the direct discharge of animal manures to waterways and water bodies. In addition, groundwater contamination may occur in a similar manner to those described for organic manure loading.

  Land areas planted in hay typically do not receive any pesticide applications and only very limited additional nitrogen application. This type of agricultural land use does not represent any significant threat to ground or surface waters.

* Animal Holding Areas - Animal holding areas represent a high potential for significant impacts on both surface and groundwaters. Runoff of animal wastes, particularly where large amounts of animals or wastes are kept, may result in the direct runoff of nutrients and bacteria into surface waters. Holding areas in close proximity to surface waters or which drain into conduits to surface water bodies pose a particularly large threat. These precautions are magnified for manure storage lagoons which may hold large amounts of animal wastes.

  Significant groundwater impacts from animal holding or animal waste storage areas are possible in areas where the water table is high or where infiltration rates are high. These potential impacts are the same as those listed in the cropland section. However, due to the greater quantity of nutrients per area, the potential impacts are considerably greater.

* Wash and Processing Water - Milk room wash water and crop cleaning and processing wash water have the potential for contaminating surface or groundwater when not properly treated and disposed. A potential source of contamination which is not normally considered is wash or rinse water from pesticide spraying equipment. Water used to clean the inside of pesticide spray tanks or equipment is often drained in a small land area which may lead to groundwater contamination.

* Waste Application Areas - These are areas specifically identified for the application of liquid or solid agricultural waste such as milk room wastes, lagoon effluent and liquified manures. There is the potential for contamination by runoff and/or infiltration of nutrients, bacteria, and chemicals. This category also applies to areas specifically identified for approved applications of sludge, septage, or other non-farm wastes.

* Composting Areas - Land areas used for the composting of agricultural, industrial, and residential wastes may represent another potential source of pollution. The exact degree of potential contamination is difficult to determine since the threat is based on the types of materials which are being composted and the actual composting procedures. Materials that contain high levels of nutrients and that are uncovered to the rain represent an increased risk to groundwater or conceivable runoff to surface waters.

2. Regulatory Background

The regulation of agricultural activities falls within the purview of numerous federal, state and local agencies. However, an overview of the regulations and programs indicates that the majority of the programs may be divided between assistance and regulatory programs.

The assistance and/or support programs are primarily funded and operated by the United States Department of Agriculture (USDA) Agricultural Stabilization and Conservation Service (ASCS), Natural Resource Conservation Service (NRCS), and Cooperative Extension Service (CES). In addition, the Massachusetts Department of Food and Agriculture (DFA) provides assistance to state agriculture by promoting locally grown products, development of new markets and programs. The Integrated Pesticide Management (IPM) program is a prime example of new programs developed to assist Massachusetts agriculture and mitigate potential sources of environmental contamination.

The IPM program was developed by the University of Massachusetts and the CES staff with DFA funding. The aims of the IPM program is to reduce the needs and consequently the impacts of pesticides on the environment by using environmental, cultural, and biological means to control pest problems. An IPM program has been developed for eight agricultural activities with significant reductions in pesticide use.

The regulatory programs which address sources of agricultural contamination are primarily located within the Massachusetts Department of Food and Agriculture (DFA) and Environmental Protection (DEP). The pesticide laws and regulations administered by the DFA are derived from authority granted under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). However, several DEP divisions also regulate some activities associated with agriculture such as alterations to wetlands. The Pesticide Bureau of the DFA is the lead state agency for the regulation of pesticides in Massachusetts. In order to minimize the impacts which

pesticides may have on the environment the Bureau has adopted regulations and developed programs to mitigate the potential pesticide contamination of ground and surface waters.

The DFA Pesticide Bureau promulgated the Rights-of-Way Management regulations (333 CMR 11.00) in 1987 which prohibit the use of herbicides on sensitive areas within utility and railroad rights-of-way. In 1990 the Bureau also promulgated the Protection of Groundwater Sources of Public Drinking Water Supplies from Nonpoint Source Pesticide Contamination Regulations (333 CMR 12.00) which prohibit the use of regulated pesticides within the zone of contribution of high capacity public wells. These regulations have potential to significantly limit the nonpoint impacts of pesticide use near public wells..

The Pesticide Bureau has also taken other steps to mitigate the impacts of pesticides on the environment. In 1987 the Bureau proposed to reclassify as state restricted use certain pesticides with potential to leach to groundwater. Furthermore, the Bureau is developing a Generic State Management Plan for pesticides which are identified as potential groundwater contaminants by the EPA Office of Pesticide Programs. This program will limit the use of the leachable pesticides to areas that are not susceptible to groundwater contamination.

An overall assessment of water quality problems indicates that there are water pollution problems from agricultural nonpoint sources in Massachusetts. However, those problems are limited in scope and area and do not present widespread impacts on water resources of the Commonwealth. This is due to several factors, including: the reduction in Massachusetts agriculture, better public awareness of potential problems, new regulations and programs, and reduction in the use of highly leachable pesticides. Farmers themselves are also becoming better educated and sensitive to the environmental impacts of their activities.

3. Wetlands Regulations and Agriculture

After over two years of meetings, negotiations and hearings, the DEP has now issued revisions to the Wetlands Protection Act regulations impacting agriculture.

M.G.L. Chapter 131, Section 40, the Wetlands Protection Act provides an exemption from regulation for "work performed for normal maintenance or improvement of land in agricultural use". Over the years farmers have experienced local conservation commission and DEP officials interpreting the exemption in varying and inconsistent ways.

In 1991, the Massachusetts Legislature approved a bill establishing the Farmlands Advisory Committee (FAC) to review the regulatory language defining the exemption. The FAC consisted of two farmers, a representative of the Natural Resource Conservation Service (NRCS), a representative of the Cooperative Extension and a member of a local Conservation Commission. The FAC members met regularly over a two year period with DEP and DFA officials, Farm Bureau representatives, farming organizations and environmental groups. State-wide hearings were held on draft regulations and negotiations continued until the final regulatory language was agreed upon.

The final regulations are codified under 310 CMR 10.00. The revised (1993) regulations define "land in agricultural use" and the various farming practices that are considered normal maintenance activities and improvement activities allowed under the exemption. The revised regulations provide for clear, and more consistent administration of the agricultural exemption by DEP and local Conservation Commissions. The DEP conducts workshops to educate both the farming community and regulators as to the new language and its interpretation.

Existing agricultural work can continue and can be classified as a Limited Project under the Wetlands Protection Act. Certain activities of land in agricultural use, however, which have a significant impact on wetland resources can only be allowed if the farmer has a NRCS approved management plan in effect. New or different agricultural improvement projects which have a significant impact on wetland resources also must have an NRCS approved plan. Incorporating an NRCS plan into farming activities will result in less siltation, erosion, and other NPS problems for new farming activities. Repairs and safeguards from storm damage,

however, can be approved on an emergency basis. One other important change which should be mentioned is Land in Agricultural Use can remain fallow for up to five years without a change in use.

Regulation of nonpoint source pollution from agriculture is limited in Massachusetts. Work on land currently in agricultural use is exempt from regulation under the state Wetlands Protection Act. Agricultural activities on land NOT currently in agricultural use are generally subject to Wetlands Protection Act regulation, although certain new activities which are designed to "maintain or improve" existing agricultural land (e.g., construction of a new irrigation system next to a currently farmed field), may go forward without review if their impacts on wetlands are small. Some such new agricultural improvement activities that have greater wetland impacts may go forward under the Wetlands Protection Act only if they are consistent with a Conservation Plan certified by the Natural Resource Conservation Service.

4. STRATEGY

The Watershed Initiative approach of the core Nonpoint Source Program described in Volume I will result in the identification of nonpoint source pollution problems within each basin. These nonpoint source pollution problems may affect surface water, groundwater or coastal waters. The strategy for agricultural nonpoint source pollution problems will be as follows:

1. Watershed Teams should determine if the situation can and should be addressed through any other existing regulatory or non-regulatory program. If yes then coordinate with that program and agency to effectively address the problem.

2. If there is no other effective or meaningful programmatic solution then the nonpoint source pollution problem will be evaluated and prioritized by the Watershed Team for inclusion in the Watershed Management Plan. This evaluation and prioritization process is the same as that described in Volume I and will include the following information:

   - Water quality monitoring and assessment data from any reliable source.

   - Local and or regional information.

   - The total maximum daily load analysis and implementation plan.

D. CONSTRUCTION

1. Nonpoint Source Background

- Land development - Removal of existing vegetation and the excavation and grading operations associated with construction of residential, commercial and industrial areas results in increased rates and volumes of runoff. Sheet, rill and gully erosion may result from these changes. Base flow volumes are frequently affected by extensive development of watershed areas.

- Highway Bridges, Roads - New road construction frequently crosses or comes close to drainage ways, streams, and other waterbodies. Erosion of soil from disturbed areas may directly enter waters. Road reconstruction activities, including surfacing, ditch and slope maintenance can result in runoff of petroleum products and erosion of soil from disturbed areas. An increase in rates and volume of runoff may also be caused by the land use changes.

2. Regulatory Background

a. Wetlands Protection Act

The major nonpoint source issue addressed here will be erosion and sedimentation. In terms of state regulatory programs that currently address this issue the foremost is the Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations adopted thereunder. The law and regulations are administered by local conservation commissions which review applications (called Notices of Intent) for permits (called Orders of Conditions). The State Department of Environmental Protection hears appeals from conservation commission decisions.

The construction activity covered by the act is virtually any development activity including site preparation. The resources protected under the act are marshes, meadows, swamps and bogs which border any of a list of bodies of water (lakes, creeks, rivers, streams, ponds, estuaries, or the ocean). The statute also covers work on land subject to flooding as well as land subject to coastal storm flowage and tidal action and is thus much more than a "wetlands protection" statute.

The act covers any construction work within a 100-foot buffer zone of the previously listed resource areas. Work outside the 100-foot buffer zone can be regulated only after alteration of a resource area occurs. Thus, work altering wetlands and flood plains from a distance (as through changes in drainage, discharges of pollution, and siltation from erosion) require a permit only after the alteration takes place.

In 1996 the Legislature amended the Wetlands Protection Act to include new wetlands resource areas known as “riverfront area.” This was the so-called Rivers Protection Act. The newly protected resource is that area of land situated between a river’s mean annual high water-line and a paralled line located 200-feet away, measured horizontally from the river’s mean annual high water line. The riverfront area is defined as 25-feet in certain densely populated urban areas and there are a few exempt activities and projects.

Enforcement of the act is initially vested in the local conservation commission and involves the issuing of "Enforcement Orders." Noncompliance can then be reported to the Department of Environmental Protection which has the authority to issue administrative penalties in the way of fines. Judicial enforcement is also possible.

Since the issuance of the original (1989) Management Plan, the wetland protection regulations have been amended three times in addition to the Rivers Protection Act amendment mentioned earlier; in 1990, 1992 and 1993. The main thrust of these regulatory revisions has been to address the exemption in the Wetlands Protection Act for "normal maintenance" and "normal improvement" of "lands in agricultural use". The revised regulations clarify these activities in some detail so as to help farmers understand just what is and what is not exempt. For more information on these regulatory changes as they relate to agricultural practices and NPS pollution please see the 'Agriculture' section of this plan.

In terms of soil erosion and sedimentation the revised regulations do include new requirements for limited projects to comply with the U.S. Natural Resource Conservation Service (NRCS) soil erosion standards. While a Notice of Intent (NOI) must now be filed for certain construction projects it is presumed in the new regulations that a NRCS approved Conservation Plan avoids or minimizes impacts to wetland resources.

Another wetlands regulatory change that pertains to soil erosion and sedimentation was the elimination of the provision allowing the loss of up to 5,000 square feet of bordering vegetated wetland for projects located within an Area of Critical Environmental Concern (ACEC). Any such project must now comply with the regulations and thus address soil erosion and sedimentation issues. The requirement of 1:1 replication in wetlands continues unchanged.

b. <u>401 Water Quality Certification Program</u>

The original (1989) Management Plan did not make specific reference to the 401 Water Quality Certification (WQC) Program. It is included here for two reasons: first, there has been a change in the administration of this program, and second, the WQC Program is a regulatory program that addresses construction activities and soil erosion and sedimentation.

Under Section 401 of the federal Clean Water Act anyone proposing any activity that will result in a discharge to waters or wetlands in the state is required to obtain not only a federal permit but certification from the state (DEP) that the project will comply with applicable state water quality standards and other state laws. Thus, if a project needs a federal permit, any activity on the site which could discharge pollutants or violate water quality standards is subject to 401 Certification.

Although the 401 WQC Program is generally associated with NPDES point sources of pollution, it is in the administration and application of the program that directly relates to construction activities that may cause erosion and sedimentation. Types of activities include, but are not limited to: placement of fill that is necessary for the construction of any structure in waters of the state; the building of any structure or impoundment requiring rock, sand, dirt or other material for its construction; site development fills for recreational, industrial, commercial, residential and other uses; causeways or road fills; dams and dikes; artificial islands; property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters and revetments; beach nourishment; levees; and fill for structures.

Under the regulations for the 401 WQC Program (314 CMR 9.00) the EPA must certify that there is reasonable assurance that the activity will not violate water quality standards. DEP may impose conditions necessary to maintain water quality, minimize damage to the environment and promote compliance with other applicable provisions of state law. This is the nonpoint source part of the WQC program. The conditions generally include the requirement that best management practices (BMP's) are implemented to prevent and/or control soil erosion and sedimentation.

As mentioned earlier, an important change in the WQC Program has been in the administration of the program. After October 1, 1992, the administration of the program was switched from the Division of Water Pollution Control in Boston to the Division of Wetlands and Waterways in DEP regional offices. The DEP thus consolidated its two wetlands regulatory programs in the regional offices for the purposes of streamlining the programs and reducing confusion and redundancy. The regional offices now directly administer the 401 WQC Program and the Wetlands Protection Act. They can perform more efficient site visits and require individually tailored erosion control plans for each project. This is an important aspect of the programs and will result in the more efficient and comprehensive implementation of BMP's. Equally important is the capability of post-implementation visits and enforcement actions if necessary.

The State has proposed new regulations to fully integrate the Federal 404 with the State 401 Water Quality Certification and Wetland Protection Act responsibilities. Additionally, the Nationwide Permitting "exemptions" under the Army Corp of Engineers 404 program have been replaced with a Programmatic General Permit which streamlines the project review thresholds. We believe these changes will reduce certain activities, particularly those affecting ORWs which lead to NPS pollution.

c. Erosion and Sedimentation Control Legislation

There currently does not exist any specific state legislation controlling erosion and sedimentation, but this may change in the near future. There will be a strong push for some type of state-wide erosion and sediment control legislation due to the requirements of the Coastal Zone Reauthorization Act, Section 6217. The original (1989) Management Plan made mention of then pending legislation entitled "An Act Controlling Erosion and Sedimentation in the Commonwealth" which is now receiving new attention. The proposed bill requires approval of an erosion and sedimentation plan by the local conservation commission for any alteration of more than 10,000 square feet of surface area or alteration of slopes greater than eight percent. The Conservation Districts, U.S. Department of Agriculture, Natural Resource Conservation Service and State Commission for Soil, Water and Related Resources would all have certain roles in plan preparation or approval.

The reader is referred to the section of this plan on long-term strategies for further discussion on this subject.

d. State Commission for Conservation of Soil, Water and Related Resources

The original (1989) Management Plan described the efforts of the State Commission for Conservation of Soil, Water and Related Resources (The Commission) to develop , adopt and implement a five year natural resources action plan in cooperation with the state's conservation districts. This plan, entitled "Fading Choices - Rising Issues" has been completed and published.

The following executive summary is excerpted from the action plan:

SUMMARY OF PRIORITIES AND POLICY RECOMMENDATIONS

The final section of this Plan, *The Five-Year Action Plan*, presents 8 Key Priorities designed to address the most urgent soil, water, and related resource concerns in the Commonwealth. In accordance with the intent of this Plan, only those actions that can be initiated through the State Commission and Conservation Districts are recommended. In this regard, the Key Priorities also address the capabilities of the Districts to implement this Plan. Associated with these Key Priorities, are 7 Policy Recommendations to the Secretary of the Executive Office of Environmental Affairs. What follows is a summary of these Policy Recommendations and Key Priorities.

Key Priorities

1. Control the erosion and resulting sedimentation from certain land disturbing activities by supporting the establishment of a state-wide Soil Erosion and Sedimentation Control Law.

2. Reduce nonpoint source pollution by establishing the Massachusetts Conservation Districts as the Key force in identifying and addressing agricultural and related nonpoint sources, as a component of the Massachusetts Nonpoint Management Plan (by DEP). Support current legislative initiatives to implement the Massachusetts Nonpoint Management Plan.

3. Hire full time staff for the Conservation Districts and a Natural Resources Planner for the State Commission to enable them to effectively address the soil, water, and related resource concerns of the Commonwealth and to implement the Natural Resources Conservation Plan.

4. Secure full funding for the operational and staffing requirements of the State Commission and the Conservation Districts by recommending that they become a line item in the budget of the Executive Office of Environmental Affairs.

5. Firmly establish Conservation District identity by:

   - Authorizing them to be responsible for certifying the technical adequacy of Soil Erosion and Sedimentation Control Plans, as part of the Erosion and Sedimentation Law noted above.

   - Establishing them as the key organization to address the agricultural and related resource provisions of the proposed Massachusetts Nonpoint Source Management Plan by DEP.

   - Implementing a public information program designed to educate the public of the State Commission's/Districts' responsibilities and the full scope of the services they provide.

6. Improve communications between the Districts, the State Commission, state and federal agencies, and environmental groups by:

   - Establishing regular and systematic communications between these groups, formalizing existing agreements, and establishing new Memoranda of Understanding for communications and mutual assistance.

   - Establishing regional Environmental Technical Teams utilizing available technical assistance personnel from local, state, and federal agencies such as a forester, botanist, soil scientist, local and regional planner, that would focus their resources on the most critical needs in each region of the State.

7. Assist the Conservation Districts with the formulations and implementation of specific yearly Action Plans designed to focus and coordinate their efforts towards addressing the priorities of this Plan by establishing the position of State Natural Resources Planner as staff to the State Commission (noted in #3).

8. Educate the citizens [and the local municipal officials] of the Commonwealth on the environmental impacts of their actions and the economic/social benefits to be derived from their investment in conservation by:

   - Establishing the Conservation Districts as a key regional body to help coordinate state environmental education programs and workshops.

   - Introducing conservation education into the standard school curriculums.

POLICY RECOMMENDATIONS TO THE SECRETARY OF THE EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

SOIL EROSION AND SEDIMENTATION

Direct that all state land use planning activities include provisions for erosion and sedimentation control

- Establish a policy for directing manpower to assist local land use planning with methods to effectively promote "quality development" which recognizes the environmental foundation of all land use decisions. It is further recommended that this assistance be coordinated with the efforts of Regional Planning Agencies.

- Establish a policy to mitigate the difference in goals implementation between state and federal agencies regulating land use near streams.

AGRICULTURAL LAND USE

- Establish a policy on agricultural land conversions to address the impacts that projects funded by the state have upon agricultural land. It is recommended that this be done in conjunction with Executive Order #193 which calls for state agencies to mitigate the impacts of their programs on agricultural lands.

WATER QUANTITY

- Establish a policy, expanding upon existing water resource policies to recognize and integrate the interconnections of all water resources and uses. Such a policy should particularly concentrate on the issues surrounding water supply, quality, use (e.g. recreation and wastes), and conservation.

WATER QUALITY

- Establish a policy for the Commonwealth to address the impacts of ocean dumping, sludge disposal, incineration at sea, and offshore sand and gravel mining.

COMMUNICATION, EDUCATION, AND OPERATIONS

- Establish a policy requiring each environmental agency to have an educational mission.

The plan targets the Conservation Districts to perform the task of implementing the plan by coordinating the cooperation of private land owners and public agencies. This plan directly addresses the impact of soil erosion and sedimentation on water quality. The executive summary clearly shows that the scope of the plan is broad and covers agricultural and nonagricultural issues. Special attention is directed here to key priority number 2 which specifically focuses on reducing nonpoint source pollution through implementation of the NPS Management Plan.

The Management Plan applauds and endorses the five year action plan - "Fading Choices and Rising Issues". The Nonpoint Source Program will assist in the implementation of the plan in whatever meaningful way is appropriate. This effort of assistance would be integrated on a watershed basis in conformance with the Watershed Initiative outlined in Volume I of this plan. Specific assistance would be administered through the conservation districts on a cooperative basis.

The section of this plan on long-term strategies will describe proposed initiatives which round out a comprehensive approach to addressing nonpoint source pollution from construction activities on a state-wide basis.

3. STRATEGY

The Watershed Initiative approach of the core Nonpoint Source Program described in Volume I will result in the identification of nonpoint source pollution problems within each basin. These nonpoint source pollution problems may affect surface water, groundwater or coastal waters. The strategy for construction related nonpoint source pollution problems will be as follows:

1. Watershed Teams should determine if the situation can and should be addressed through any other existing regulatory or non-regulatory program. If yes then coordinate with that program and agency to effectively address the problem.

2. If there is no other effective or meaningful programmatic solution then the nonpoint source pollution problem will be evaluated and prioritized by the Team for inclusion in the Watershed Management Plan. This evaluation and prioritization process is the same as that described in Volume I and will include the following information:

   - Water quality monitoring and assessment data from any reliable source.
   - Local and or regional information.
   - The total maximum daily load analysis and implementation plan.

E. URBAN RUNOFF

1. Nonpoint Source Background

- Storm Drains - Street drains receive runoff from the land, building roofs, pavements, and through infiltration from groundwater. Street catch basins are often receptacles of accidental and illegal dumping of wastes including waste oils. As such, storm drains are a potential conduit for nearly any type and kind of natural or society-generated pollutant. Past practices of locating drain outlets at ponds, streams and estuaries has resulted in direct contamination of water bodies. Pollutants include heavy metals, particulates, organic matter, nutrients and bacteria.

- Surface Runoff (Impervious Areas) - This includes highways, roads, parking areas, malls and similar facilities. These areas produce and emit the same contaminants as are received by stormwater drains.

- Surface Runoff (Pervious Areas) - These include lawns, parkland, recreational play areas, golf courses, etc. Contamination of runoff and groundwater from applied organic and inorganic fertilizers or pesticides and other materials such as wastes from domestic animals is a problem.

- Infiltration Wells and Basins - These include dry wells, catch basins, infiltration ponds and similar structures and devices designed to discharge untreated stormwater runoff, cooling water and similar discharges into the ground. If designed, sited and constructed correctly many infiltration devices can be positive controls and not sources of pollutants.

- Urban runoff is a major cause of eutrophication and bacterial contamination to the waters of the Commonwealth (Assessment Report, 1988).

2. Regulatory Background

For the purposes of this Management Plan urban runoff will include storm drains and surface runoff but not combined sewers. In Massachusetts combined sewers are considered point sources and are being addressed elsewhere under other programs.

a. The Storm Water Permit Program

Although this program is considered a point source program and thus outside the purview of this Management Plan as implemented under Section 319 of the Clean Water Act, it is described here (as it was in the original plan) for the very pertinent reason that it does, in fact, address urban runoff.

The stormwater permit program is a two-phased program enacted by Congress in 1987 under section 402(p) of the Clean Water Act. Under Phase I, NPDES permits are required to be issued for municipal separate storm drains serving large or medium-sized populations (greater than 250,000 or 100,000 people, respectively) and for stormwater discharges associated with industrial activity. Permits are also to be issued, on a case-by-case basis, if EPA or a State determines that a stormwater discharge contributes to the violation of a water quality standard or is a significant contributor of pollutants to waters of the State. EPA published a rule implementing Phase I on November 16, 1990.

Under Phase II, EPA is to prepare two reports to Congress that assess remaining stormwater discharges; determine, to the maximum extent practicable, the nature and extent of pollutants in such discharges; and establish procedures and methods to control stormwater discharges to the extent necessary to mitigate impacts on water quality. Then, EPA is to issue regulations and designate stormwater discharges, in addition to those addressed in Phase I, to be regulated to protect water quality and is to establish a comprehensive program to regulate those designated sources. The program is required to establish (1) priorities, (2) requirements for State stormwater management programs and (3) expeditious deadlines. These regulations were to have been issued by EPA not later than October 1, 1992. However, due to the emphasis on Phase I the completion of Phase II regulations did not occur until October/November, 1999.

b. Coastal Nonpoint Pollution Control Program

This program, which was discussed earlier in this Volume and Volume I of the Management Plan, will further address urban runoff and set forth strategies for implementing management measures. The reader is referred to Coastal Zone Management's plan for a complete description of the Section 6217 Coastal Nonpoint Pollution Control Program.

c. General State-wide Program

The Massachusetts DEP, through its Division of Watershed Management (DWM) has developed a draft Stormwater Management Manual which was subsequently issued in 1997 by DEP and CZM as state policy.. This manual sets forth minimum design or performance standards for stormwater best management practices (BMP's) which will minimally meet the standards described in the "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" issued by the EPA in conformance with Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990. The "Guidance" specifies that:

1**) By design or performance**:

a) After construction has been completed and the site is permanently stabilized, reduce the average annual total suspended solids (TSS) loadings by 80 percent. For the purposes of this measure, an 80 percent TSS reduction is to be determined on an average annual basis,* or

b) Reduce the post development loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings, and

2) To the extent practicable, maintain post development peak runoff rate and average volume at levels that are similar to predevelopment levels.

[*based on the average annual TSS loadings from all storms less than or equal to the 2-year 24-hour storm. TSS loadings from storms greater than the 2-year 24 hour storm are not expected to be included in the calculation of the average annual TSS loadings.]

The Stormwater Management Manual also includes recommended stormwater management BMP's with specific design and construction criteria.

This Manual is meant to be used state-wide by any public or private entity involved with any construction or development activity requiring BMP's for stormwater management. The DEP and CZM will coordinate with all relevant state agencies to have the Manual used to its fullest possible extent. Copies of the Manual will also be distributed to all municipalities to be used to its fullest possible extent on the local level.

Some specific strategies, including legislative mandate, regarding the use of the Manual on a state and local level will be later described in the section of this plan on long-term strategies.

It is felt that by having a single manual on stormwater BMP design and construction to be used state-wide on all levels of government there will be achieved a high level of consistency in meeting the performance standards of the BMP's. The reader is referred to Coastal Zone Management's plan on the Coastal Nonpoint Pollution Control Program for additional information regarding this general state-wide program on urban runoff.

3. STRATEGY

The Watershed Initiative approach of the core Nonpoint Source Program described in Volume I will result in the identification of nonpoint source pollution problems within each basin. These nonpoint source pollution problems may affect surface water, groundwater or coastal waters. The strategy for urban runoff nonpoint source pollution problems will be as follows:

A. Watershed Teams should determine if the situation can and should be addressed through any other existing regulatory or non-regulatory program. If yes then coordinate with that program and agency to effectively address the problem.

B. If there is no other effective or meaningful programmatic solution then the nonpoint source pollution problem will be evaluated and prioritized by the Team for inclusion in the Watershed Management Plan. This evaluation and prioritization process is the same as that described in Volume I and will include the following information:

- Water quality monitoring and assessment data from any reliable source.
- Local and or regional information.
- The total maximum daily load analysis and implementation plan.

C. In any event, the Stormwater Management Manual has been distributed to every municipality in the state and will be highlighted in the Phase II outreach efforts described in Volume I.

F. RESOURCE EXTRACTION

1. Nonpoint Source Background

- Surface Extraction Areas - These are gravel pits, surface mines and similar areas. Exposed soil and mineral resources are subject to wind and water erosion. Both surface and groundwater hydrology may be changed due to these land use changes.

- Processing Facilities - Sorting, washing and other processing facilities or storage of extracted and waste resources may contribute dusts and solids to nearby waterways.

- Offshore drilling areas - These operations run the risk of releasing oil or related material to the offshore waters and thereby causing coastal pollution and marine fisheries habitat pollution

2. Regulatory Background

Massachusetts does not have any mining operations on the scale of western United States nor does it have much mining activity of any type except for sand and gravel operations, lime plants and rock quarries. Mining represents less than 0.2 percent of the gross state product (GSP) (United States Department of Interior, 1979). In terms of nonpoint source pollution this plan will focus on sand and gravel operations because the extent of any problem with the limestone plants and rock quarries is minimal or unknown. Historically there were also iron bog mines scattered over the state but these are long since defunct. Other indigenous mineral products from Massachusetts include, clay, peat and gem stones (United States Department of Interior, 1979). Offshore drilling and mining activities are considered as point source discharges and are required to obtain NPDES permits for all discharges (sewage, deckwash, drilling mud, etc.).

The assessment report did not indicate any water quality problems from sand and gravel or related operations. But as mentioned earlier, only the main stems of the rivers have been assessed and not the tributaries. There is another concern relative to sand and gravel operations distinct from nonpoint source pollution of surface waters and that concern is the protection of groundwater. It is well known that the best aquifers for water supply are composed of sand and gravel material. What one often ends up with is two competing needs: water supply and aquifer protection and the economic worth of commercial mining of the sand and gravel. The Division of Water Supply within the DEP is acutely aware of this and is aggressively addressing the issue. In terms of regulatory programs which affect sand and gravel mining there is a directly related one at the local level and an indirect one at the state level.

The local level regulations take the form of earth removal permits usually administered by the local zoning board of appeals or planning boards. Such regulations, encompassed in the local zoning bylaws, generally cover the removal of sod, loam, clay, sand, gravel or any earth product, earth constitute or earth material from any land.

Indirectly, the state regulations apply to water supply protection or well head protection. As mentioned above, this public water supply protection which consists of regulations and departmental policy is primarily oriented toward protecting the drinking water quality. The regulations and policy affect land use around the well head and thereby can affect the mining of the sands and gravel in the aquifer surrounding and feeding the well. This program and the nonpoint source strategy will be further discussed as a separate item below. The nonpoint strategy relative to resource extraction of sand and gravel will be as follows:

3. Strategy

This strategy will be aimed at providing educational and technical assistance to local authorities administering earth removal permits. The strategy will be coordinated by the DWM and Division of

Water Supply working with the Watershed Teams so that the issue of present and future water supplies can be addressed.

The Mega Manual will be the major guidance document utilized for technical and educational assistance. The approach will be to assist the Teams to incorporate a strategy to address resource extraction operations into the outreach effort described in Volume I of this plan. Using the Mega Manual on a watershed by watershed basis, the strategy will include:

a) A discussion of potential nonpoint source pollution from earth removal activities;
b) groundwater protection and the importance of sand and gravel aquifers for water supplies;
c) suggested approaches to issuing earth removal permits in terms of special conditions to control nonpoint source pollution and protect groundwater;
d) the timing for this strategy will be consistent with the state-wide basin schedule outlined in Volume I of this plan.

G. LAND DISPOSAL

1. Nonpoint Source Background

- Landfills - These include both operating and closed private and municipal landfills used for disposal of garbage and other residential, commercial and industrial wastes considered to be non-hazardous material. Surface runoff from these areas may contribute sediment to nearby waters plus transport a variety of contaminants washed from the material. The decomposition of these wastes generate large volumes of liquids which mix with the substances deposited to form a variety of compounds which may percolate to surface and subsurface waters.

- On-site Waste Systems - These are treatment systems characterized by a septic tank and effluent disposal system. Contributions of nutrients, particularly nitrogen and phosphorous to groundwater may occur. System failures commonly result in above ground breakouts of untreated leachate and may contaminate surface waters. Commercially sold septic tank additives are a source of toxic organic compounds.

- Hazardous Waste Areas - These may be located over defined or non-defined areas where hazardous wastes of chemical, biological, or mineral material is stored, has been stored, or spread on the land. Contamination of surface and groundwaters may result from runoff or percolation of water through the area.

- Organic Waters-Sludge-Septage - This includes treated and untreated plant and animal residues from food processing facilities such as fish gurry and fruit pumice, as well as approved sludge from waste treatment plants and pumpings from septic tanks. Concentration of these materials in stockpiles or applications to the soil present a potential for runoff to surface waters. Some of these products are high in nitrogen which may be discharged to ground and surface waters. Heavy metals are often associated with sludge from treatment plants serving industrial customers.

2. Regulatory Background

a. Landfills

For the purposes of this section of the management plan the discussion on nonpoint sources from land disposal will focus on landfills. The issue of septic systems will be addressed under long-term strategies.

The assessment report indicates that nonpoint source pollution of surface waters from landfills exists, but is not significant. Groundwater contamination, however, is another question. Groundwater monitoring around landfills in the state has until recently been minimal. Most of the state's data that do exist are from water supply wells. Because of the importance of groundwater and water supply the issue of land disposal is being included in this plan.

The following Executive Summary is taken from the Massachusetts Solid Waste Master Plan – 1997 Update; Volume I. It is followed by the 1999 proposed Amendment to the Solid Waste Master Plan.

EXECUTIVE SUMMARY: 1997 SOLID WASTE MASTER PLAN UPDATE

SUMMARY

The 1997 Update to the Solid Waste Master Plan reports on the performance of the solid waste system over the last two years. It introduces the Commonwealth's plans for reinvigorating progress toward meeting the waste reduction, toxics reduction, and recycling goals for the year 2000. It describes the plans to ensure that necessary disposal capacity will meet the state's need and will have the least potential impact on our health, safety, and the environment. These plans include:

- Implementation of the "Goal 2000 Program" combining incentives, education, and enforcement to broaden and accelerate the Commonwealth's efforts to reduce the volume and toxicity of waste and meet its 46% recycling goal.
- Maintain the moratorium on landfill expansions for municipal solid waste (MSW) while temporarily lifting the moratorium for non-municipal solid waste (non-MSW), to ensure that sufficient disposal capacity will be constructed to meet the projected capacity need in 1998 and 1999.
- Deferring promulgation of the draft Capacity Allocation Process (CAP)regulations to allow for further dialogue among the regulated community, the public, and DEP on the standards and procedures to be put in place to manage disposal capacity development and further reduce the risks to our well being and the ecology.

Introduction

We are now seven years into a ten-year plan for integrated solid waste management first laid out in the 1990 Solid Waste Master Plan. The state continues to make progress toward achieving its goal of recycling 46% of MSW by the year 2000; and our recycling rate stands at 33% at the end of 1996. However, the gains made in the first seven years of the Plan will not be as easy to replicate in the next three years. Reaching the 46% recycling goal will require a sustained effort from both the public and private sectors.

The Cellucci Administration continues to believe that the effort and resources expended in reaching the goal are a smart investment with numerous returns. Reducing waste disposal and increasing recycling, continues to bring environmental and economic benefits to the Commonwealth. Since 1990, recycling has diverted more than 5.2 million tons (mt) of material from combustion facilities and landfills, returning the material to a beneficial use. Current estimates are that Massachusetts secondary materials manufacturers directly employ nearly 12,000 people, ranging from small companies to large-scale manufacturers, who use at least 20 different recycled feedstocks to

create a multitude of products. These manufacturers create an additional 50,000 associated jobs and contribute $600 million to the Massachusetts economy annually.

Waste diversion means fewer landfills and combustion facilities with their associated adverse impacts. Manufacturing with recycled material is also far less costly to the environment in natural resource and energy consumption. Recycling also means lower overall waste management costs for most municipalities. Furthermore, through the .increased recycling of used oil, paint and mercury-containing products, toxic materials have also been increasingly diverted from potentially improper disposal in septic systems, sewers, landfills, and combustion facilities

Waste System Performance In 1995 And 1996

Massachusetts generated 6.76 mt of MSW in 1995 and 7.33 mt of MSW in 1996. Imports and exports were nearly in balance in 1995 at approximately 450,000 tons versus 470,000 tons, but in 1996 imports rose to 652,006 tons and exports nearly doubled to 824,000 tons. MSW recycling grew to 32% in 1995 and 33% in 1996, an increase of just 1% per year from the 1994 rate. Of total MSW generated, 47% and 44% was disposed in combustion facilities in 1995 and 1996 respectively, while 21% and 22% was landfilled in each year.

Non-MSW generation was 4.02 mt in 1995 and 4.27 mt in 1996. Of this non-MSW, 77% was recycled in 1995 but only 68% in 1996 , with the remainder disposed primarily in landfills.

The revisions to the 1996 waste generation and import/export rates from the amounts reported in the Draft Update was the result of the coordinated efforts of DEP and the Data Group Sub committee of the Solid Waste Advisory Committee (Data Group). The Data Group comprised of stakeholders from the solid waste disposal industry, consultants, recyclers, and environmentalists, and was established for the express purpose of providing independent waste management information to DEP and advising the Department on its capacity projection and allocation procedures.

The Picture of Progress

Slower growth rates in statewide recycling should not diminish recognition of the progress that was made in communities, businesses, and government agencies over the last two years; these are "downpayments" that will lead to increased recycling rates in subsequent years. DEP and EOEA provided $8.4 million for recycling programs in the Commonwealth during this period with: over $3.4 million in direct municipal grants, enabling a dozen municipalities to begin curbside recycling; assisted over 23,000 residents to obtain backyard compost bins; brought the reduction and recycling message to 56,000 public school students; diverted nearly 400,000 gallons of automotive oil and antifreeze into 160 municipal collection centers; and created innovative recycling, hazardous household product, and educational programs in 18 communities throughout the state.

It has become clearer over the last two years that the greatest single stimulus to increasing residential recycling is the adoption of unit-based pricing systems. The unit-based price approach creates a clear personal financial incentive for households to recycle rather than throw usable materials in the garbage. Of the 75 communities with full fledged "pay as you throw" programs, over 75% received an "A" on their recycling report card. Through the example set by large cities such as Worcester and Taunton, and increased financial and technical support, DEP and EOEA will strenuously promote unit-based pricing over the next three years.

The past two years also saw an intensifying interest in reducing the toxicity of the waste stream by recycling or otherwise properly managing hazardous household materials. In 1996, EOEA and DEP released the "Massachusetts Plan for Managing Hazardous Materials from Households and Small Business," which established a blueprint for implementing a range of management programs targeted first at the most prevalent and toxic materials in the waste stream. Working with municipalities, recyclers, and product manufacturers, the Commonwealth has helped initiate local and statewide programs to collect and recycle used oil, oil filters, paint, mercury-containing products (such as batteries, thermostats, and fluorescent lamps), and a range of other toxic products. These programs, especially for Mercury containing products, will be facilitated by the Universal Waste Rule, which DEP promulgated in October, 1997. (See Chapter 2 for more information on the Universal Waste Rule.)

The crucial demand side of the recycling loop also advanced during 1995 and 1996. The Recycling Loan Fund provided $1.3 million in capital and leveraged an additional $5.5 million in investments in 8 Massachusetts companies, expanding the use of recycled materials. The state also stimulates recycling markets through research conducted by the University of Massachusetts and the Chelsea Center for Recycling and Economic Development. In addition, established businesses which recognize the economic advantage of reducing waste generation and saving on disposal costs have, with the assistance of WasteCap: redesigned packages to include more recycled content or make them returnable; switched to reusable shipping containers; and adopted paperless record-keeping technologies. The Commonwealth's effort to lead by example has also boosted its purchase of recycled products from $8.2 million in fiscal year 1994 to nearly $22 million in fiscal year 1996 and 34 million in fiscal year 1997.

Goal 2000 Recycling Strategy

Despite these efforts, over the last two years the rate of increase in recycling has slowed from the impressive gains made between 1990 and 1994. In 1995 and 1996, the rate of MSW recycling increased only 1% each year as compared to the 3% annual growth rate targeted to meet the 46% recycling goal by the year 2000. The recycling of construction and demolition waste declined 9% over the same period.

To promote further recycling improvements, the Administration's budget proposed $6 million in Clean Environment Fund spending for communities to improve their recycling performance, decrease the cost of recycling, and increase demand for recycled products. The importance of these efforts was affirmed by the legislature, which appropriated $7.0 million for the Clean Environment Fund. Financial incentives are a key element in the Goal 2000 Recycling Strategy which includes the following components:

- **Source Reduction**
  - Conduct a national survey to identify successful source reduction programs
  - Develop a state agency source reduction goal
  - Promote initiatives on packaging reduction and environmental. labeling.
- **Recycling Collection Program**
  - Core Recycling Programs - Continuation of the recycling equipment grants program and the technical assistance program to provide basic recycling services. Grants include: recycling trucks; set-out bins; consumer education materials; compost. bins; roll-off containers; technical assistance; and paint and oil storage equipment.
  - Municipal Recycling Incentive Program (MRIP) - Performance based grants to municipalities that meet a set of eligibility criteria designed to increase recycling participation and residential access to recycling programs, as well as demand for recycled products. Qualifying municipalities will receive an incentive payment (or "bounty") for each ton of designated recyclables diverted. This program will place a particular focus on unit-based pricing programs.
  - Recycling Participation Campaign - A multi-media public information campaign designed to motivate non-recyclers to change their behavior. The first phase of the campaign is being launched as a pilot in East Boston.
  - Recycling Rules - Strengthen enforcement of the waste ban regulations at facilities. Upgrade the eligibility requirements for Department Approved Recycling Programs (DARPS). Consider proposing legislation to require that all households are provided with equivalent recycling and disposal services.
- **Recycling Market Development Programs**

- Continue the Recycling Loan Fund - The Recycling Loan Fund is a state-financed loan, created by the CEF, that addresses the investment community's perceived roles when lending to recycling related businesses.

- Promote Technology Research and Development - EOEA and DEP will stimulate technological innovation in the recycling processing industry and in manufacturing of recycled products by partnering with the University of Massachusetts, Donahue Center and the Chelsea Center for Recycling and Economic Development.

- Develop a Recycling Market Strategic Plan - EOEA and DEP, in cooperation with the Chelsea Center, Massachusetts office of Business Development, -and other relevant stakeholders will conduct a strategic assessment of Massachusetts' recycling markets and business development opportunities which will provide the base line for evaluating the demand for recyclables collected in the Commonwealth so that we can increase in state processing and manufacturing, creating jobs and economic development.

- Advance Buy Recycled Programs -EOEA and DEP will continue their partnership with the Executive Office of Administration and Finance to increase purchases of recycled products by state agencies and municipalities.

➢ **Hazardous Household Products**

- Implementation of the "Massachusetts Plan for Managing Hazardous Materials from Households and Small Businesses."

- Roll out of Universal waste rule to make it easier to recycle certain common Hazardous Household Products

These initiatives, in concert with on-going efforts of the public and private sectors, are geared to fuel a resurgence in recycling over the next three years and are designed to assure our waste reduction and recycling goals are achieved.

Capacity Projections

In previous Updates to the Solid Waste Master Plan (Update), capacity need was projected only through 2000. This Update restores the ten-year planning horizon first adopted in the 1990 Master Plan. In the 1995 Update, DEP included projections of need for MSW and non-MSW (primarily construction and demolition debris) disposal capacity. The 1995 Update predicted no need for additional MSW capacity through 2000, but showed a shortfall of non-MSW capacity starting in 1998. This Update confirms the adequacy of existing MSW capacity, postpones the need for new MSW capacity out to 2000 and confirms the non-MSW shortfall. This shortfall, however, has increased from 1100 to 1800 tons per day (tpd) for 1998 and to 3100 tpd in 1999. These new projections reflect a more accurate method of estimating MSW, non-MSW and non-MSW generation, (which takes into account the recent trend of increased generation).

Capacity Allocation Strategy

Since the 1988 Site Assignment Regulations were published, DEP has permitted disposal facilities only if there was a need for the facility. The methodology for establishing prospective need for additional capacity has been continuously refined to reflect the improved quality of the data toward a goal of "no net importer/exporter" of solid waste. The "no net import" policy is designed to protect our environment and mitigate threats to our natural resources and quality of life; while the "no net export" policy is a recognition that the state has a responsibility to manage the waste its citizens produce - but no more than that - in an environmentally sound manner.

At the close of 1995, EOEA and DEP announced a moratorium on landfill site assignment and permit applications for additional disposal capacity. The moratorium was adopted in response to the increasing

number of landfill expansion proposals in the absence of a need for additional landfills and to allow the Commonwealth the opportunity to increase environmental protection through a revised permitting process.

The proposed Capacity Allocation Process (CAP) regulations applied a broader array of public health, environmental, and land use criteria than had previously been used to allocate capacity. Under this comparative review process, all potential landfill projects would have been reviewed together and capacity allocations determined prior to the permitting process. Through this model, the Commonwealth had hoped to advance the best projects with the least potential for environmental impact. Extensive public comment both supporting and criticizing the proposed CAP regulations was received by DEP during the comment period. Since then, DEP has received requests by solid waste industry and environmental advocacy groups to continue the dialogue on the permit process and criteria revisions. In response to these requests, DEP will not issue final CAP regulations now but instead will convene a work group to revise them for promulgation by summer 1998.

Due to a projected non-MSW capacity shortfall commencing in six months; coupled with the prospect of revising and implementing site assignment and permit regulations, the Draft Update proposed to temporarily lift the moratorium and permit non-MSW landfill capacity for 1998 and 1999 under the existing regulations. In response to public comments, and after consultation with the Data Group, DEP will implement an interim capacity allocation strategy. Under the revised procedures, the interim strategy will distribute non-MSW capacity regionally and increase each facility's capability to meet seasonal and unanticipated changes in regional capacity demands. Upon publication of the Update, DEP will complete the permit actions necessary to approve the construction and operation of landfills with pending applications that meet all the site suitability/permit requirements, and the additional non-MSW capacity will be operational in I998. The permits will be in effect for 1998 and 1999, and the tonnage amounts will be phased in during 1998 to match seasonal waste generation increases and projected 1999 need.

Permitting landfills located in the western, central, and eastern areas of the Commonwealth will maintain the distribution of regional capacity (which was a concern to many solid waste haulers and municipal officials). At the suggestion of the Data Group, DEP will revise the permit tonnage limits to increase a facility's ability to meet seasonal generation, while maintaining its annual limit. Regional shortfalls will also be managed through a process which allows DEP regional offices to temporarily revise permit limits to address unanticipated regional capacity demands from events such as the shutdown of a combustion facility or storm damage cleanups.

The Commonwealth's interim capacity needs will be addressed by these limited, non-MSW permit actions, allowing the moratorium on pending site assignment or other permit reviews to be reinstated. Commencing early in 1998, DEP will reopen the dialogue on the draft CAP regulations leading to promulgation of final regulations in the summer. The objective of the regulations will be to continue to limit disposal capacity development based on need and to upgrade the health and environmental criteria for disposal facility site assignments and permits. Applications to meet the projected capacity need in 2000 will be evaluated under the final CAP regulations.

The steps outlined above will allow DEP to meet its commitment to permit adequate disposal capacity over the short-term and also allow sufficient time for further public discussion of alternatives to both the current permitting standards and the proposed revised CAP regulations to address need over the long-term.

Unlined Landfill Closures

Massachusetts is close to ending its dependence on potentially polluting unlined landfills. In 1993, when enacted legislation required DEP to rank unlined landfills, there were 105 active unlined landfills that were ranked based on whether they represented a "significant threat" to the environment, a "potential threat," or "little or no threat or where too little information was known." Over the last four years, 67 of these landfills have either closed or have signed an Administrative Consent Order under which they will close over the next three years. DEP continues to negotiate with the thirteen landfills remaining to reach a mutually agreeable closure date as an alternative to a unilateral enforcement action. In addition, DEP is working with other municipalities that have inactive landfills to ensure that they are properly closed and capped.

Municipalities that have closed their landfills or are in the process of closing them have made significant investments in protecting local groundwater resources. For example, in the Southeast region alone, municipalities will spend nearly 109 million to "cap and close" 868 acres at 42 landfills. The Commonwealth has also assisted in closures by providing more than $57 million in grants through the Landfill Capping Grants program, the Central Artery Closure Grants Program, the State Revolving Fund, and the Central Artery Clay Program. Together, these programs may assist up to 143 municipalities in closing their unlined landfills.

Follow Through

Seven years ago the MSW recycling rate was IO% and we were landfilling over 40% of our waste, a substantial portion of it being dumped into 185 unlined landfills. Residents could only hope their community would collect household hazardous waste and provide safe disposal for the oil, paint, and batteries stored in their basement or garage. This Update documents the substantial progress we have made. The recycling rate has more than tripled, the landfilling rate is cut in half, only seven communities have not closed or committed to close their unlined landfills, and regular access to hazardous household product management alternatives is becoming the norm. But there is more that can be achieved. The proposals in the Goal 2000 Strategy are designed so Massachusetts can enter the next century with waste reduction and recycling-based integrated solid waste management system firmly in place, our health and environment less "at risk", and recycled manufacturing an expanding force in the economic health of the Commonwealth.

Proposed Amendment to the Massachusetts Solid Waste Master Plan to Permit Replacement Capacity at Certain Existing Landfills
6/16/99

Summary

In 1990, the Department of Environmental Protection (DEP) published the 1990 Solid Waste Master Plan, laying out a ten-year plan for managing, the Commonwealth's solid waste. Updates of this Plan were published 'in 1994, 1995, and 1997. The 1997 Solid Waste Master Plan Update (which was based on 1996 data) projected that there would be no need for additional municipal solid waste disposal capacity until 2001, assuming an increase in the municipal solid waste recycling rate to 46% in 2000. The 1997 Update did identify a need for additional non-municipal waste disposal capacity (e.g., construction and demolition debris) in 1998 and 1999. This need was subsequently met through permitting additional non-municipal solid waste capacity.

DEP has updated its solid waste capacity projections using 1997 data, current information on landfill and waste combustion facility closures, and revised recycling rates based on 1997 actual data. The specific revisions proposed to the Solid Waste Master Plan are: removal of 252,000 tons per year of capacity from Table I due to the closure of the Lawrence-Ogden incinerator (see Attachment 1); and various modifications to Table J due to improved and more current solid waste data impacting the recycling rate, the generation rate and the projected disposal capacity (see Attachment 2). DEP's updated landfill disposal capacity projections, shown in Figure 1, indicate that there is a shortfall in disposal capacity of 2,300 tons per day (tpd) in 1999.

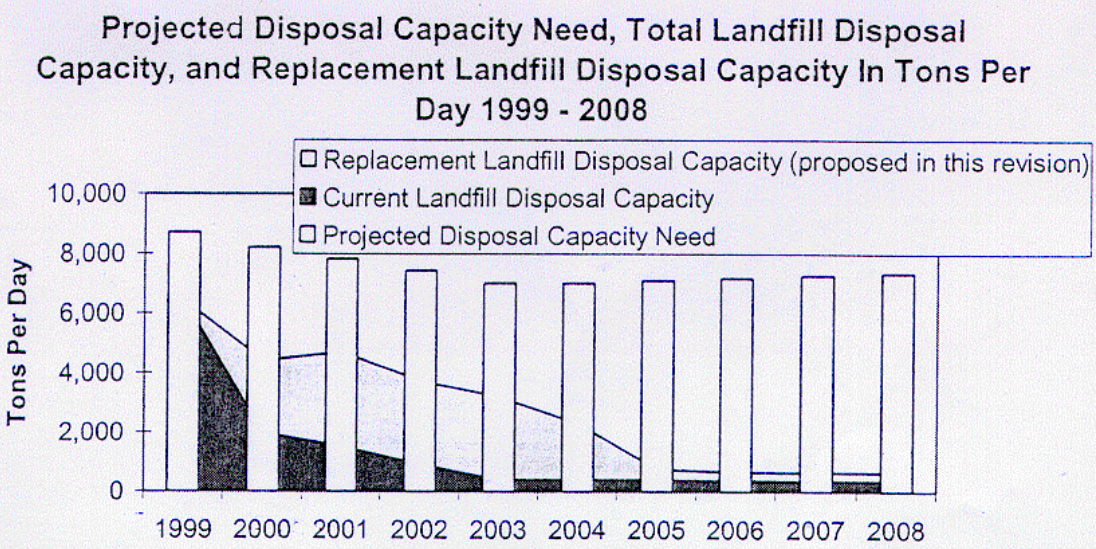
In order to meet the Commonwealth's responsibility to manage its own wastes, DEP proposes to take a number of actions to address the current disposal capacity need, including:

- enhancing programs to continue to increase recycling and encourage source reduction,
- temporarily lifting the permit moratorium allowing certain landfills whose permits will expire shortly to apply for extensions to continue operating (see Attachment 3).

These permitting actions are not expected to meet the capacity over the next decade. However, the proposed actions would address some capacity need so that the Commonwealth does not fall further behind in meeting its disposal requirements. Waste that is not recycled, incinerated or land disposed in Massachusetts continues to be exported out of the state for disposal. This export activity has 'increased annually by 100,000 tons since 1994.

By December 1999, DEP will develop, with public input, a new Solid Waste Master Plan which will update capacity projections based on 1998 data and will lay out new policies and approaches for managing solid waste in 2000 and beyond. DEP expects to publish a draft of this Plan in the Fall of 1999 for public comment.

Figure 1



*Projected Disposal Capacity Need is an estimate of capacity that does not include waste which is incinerated or recycled (recycling is estimated at a 2% per year growth until 2003).

Capacity Projection Methodology

The 1997 Solid Waste Master Plan Update used specific methodologies and assumptions to estimate generation, disposal, recycling and to project future capacity needs. DEP has used the same methodologies to develop the updated capacity projections in this document, with the exception that the rate of growth of the recycling rate has been revised as described below, and available capacity has been updated based on the most current 'information about facility closure dates.

Disposal Capacity Projections

Figure 1 shows needed disposal capacity for the total system (municipal solid waste and non-municipal solid waste combined) and does not include tonnage managed by current combustion facilities and tonnage managed through recycling programs. The disposal capacity shortfall is projected to be 2,300 tpd by the end of 1999 and 6,200 tpd in 2000. Replacement capacity at landfills will address some of this need.

The three primary reasons for the capacity shortfall occurring prior to 2001 are: (1) a decrease in capacity - the closure of remaining unlined landfills by the end of 1999 and the unforeseen closing of the Ogden-Lawrence combustion facility; (2) a higher solid waste generation rate; and (3) a slower increase in the recycling rate than was estimated in the 1997 Update. Each is discussed briefly below.

I . **Facility Closures** - DEP has been working with municipalities across Massachusetts for several years to close unlined landfills. In 1993, there were 105 active unlined municipal landfills targeted for closure and in 1999 all of these unlined landfills will be closed. Final closure or expiration of current permits at 27 landfills (both unlined and lined) by the end of 1999 will leave only 14 landfills operating in the state during 2000 and 9 in 2001. Also, in June of 1998, Ogden Corporation closed its Lawrence combustion facility because it determined retrofits to bring, the facility into compliance with DEP's new municipal waste combustor rule

would not be cost-effective. Attachment I shows that this decision removed 800 tpd of disposal capacity from the solid waste management system, representing approximately 6% of total Massachusetts disposal capacity.

2. **Slower Growth in Recycling Rate** - the recycling rate has increased 1% per year for the past three years (I995 - 1997) rather than 3 % per year as projected in previous Plans. The lower recycling rate means that more disposal capacity is needed than originally projected. Given this trend, the Commonwealth will not achieve the goal set in 1990 to recycle 46% of municipal solid waste by the year 2000, which was the basis for previous capacity projections. It should be noted that, even if the goal of 46% were to be achieved, there would still be a capacity shortfall in 2000 and a need to extend the permits of certain landfills beyond the end of 1999 (see Table 1).

TABLE 1

Projected Capacity Need in 2000 (Beyond Current Landfill Disposal Capacity)

Recycling Percentage Increase From 1998-2000	Capacity Need (tpd)		
	MSW	Non-MSW	TOTAL
Increase by 1% per year	3,500	3,400	6,900
Increase by 2% per year	2,300	3,400	6,200
Increase by 4% per year	1,400	3,400	4,800

3 **Increased Waste Generation** - the 1997 Solid Waste Master Plan Update (which was based on 1996 data) projected that 7.0 million tons of municipal solid waste would be generated in 1997. In fact, 7.4 million tons was generated in 1997, requiring more capacity than originally planned. This higher Generation rate also influences future projected generation rates (and therefore capacity need), since projected generation rates are based on an average of past years. In addition, the actual 1997 municipal solid waste recycling rate was 34%, which is less than the 37% rate projected in the 1997 Master Plan Update. Attachment 2 contains updated generation, recycling rates and capacity projections.

Given the slower growth in the recycling rate, DEP is proposing to revise the rate of growth from 4% per year (which would be required to reach 46% by 2000), to 2% per year, which is an aggressive yet more realistic rate of increase given the trend over the past few years. While this projected growth rate is higher than the 1% annual increases seen over the past three years, DEP is continuing to promote recycling in the Commonwealth through a variety of programs which the Agency believes may boost the rate of growth over the next few years. A 2% growth rate would accomplish a 46% recycling rate by 2003. DEP recognizes that, based on actual recycling data collected, DEP may need to change this assumption in the new Solid Waste Master Plan, which will be published in draft form in the Fall of 1999.

Plan for Addressing Immediate Capacity Need

In order to meet the immediate need for additional disposal capacity, DEP will move forward on two fronts:

I **Continue Efforts to Increase Our Recycling Rate** - DEP expects that the following efforts will help to increase the recycling rate by 2% per year. DEP will continue existing recycling programs, including financial assistance and outreach to municipalities for recycling in the form of recycling equipment grants, Municipal Recycling Incentive Payments, and community outreach grants. DEP will increase access to under-served populations by approximately 250,OOO citizens that currently have no recycling services. DEP will increase industry participation 'in commercial recycling, and improving markets for recoverable materials. DEP is also stepping, up waste ban compliance and expanding waste bans to transfer stations, and initiating a waste disposal ban on cathode ray tubes.

2. **Permit Solid Waste Disposal Replacement Capacity** - DEP proposes to lift the current moratorium on permitting solid waste capacity to allow certain existing, operating landfills that have expansion capability and which meet the following criteria to apply for a permit to extend the life of the landfill beyond existing permit expiration dates:

   - The landfill has already received a site assignment from the local Board of Health for the expansion area; and

   - The Massachusetts Environmental Policy Act (MEPA) process has been satisfactorily completed for the expansion in question, or, the expansion is only a vertical landfill expansion for which an Environmental Notification Form may need to be filed with MEPA.

After public comment on these proposed revisions to the Solid Waste Master Plan and a final decision, DEP expects to solicit applications for permit modifications from existing facilities that meet the above criteria. DEP anticipates making decisions in time for construction to start in spring 2000. This schedule should provide sufficient time for permits to be processed to extend operations beyond 1999 with no disruption in service. A list of landfills DEP believes meets the above criteria and which would be eligible to proceed with permit applications is found in Attachment 3. The potential additional capacity of 3,300 tpd represented by expansions at these facilities (if permitted) would address a significant portion of the projected shortfall DEP has identified.

These changes and improved estimates will result in an overall improvement to solid waste management infrastructure in the Commonwealth of Massachusetts.

Attachment 1

Appendix I
Disposal - Combustion Facilities

Massachusetts Combustion Facilities, 1997 Waste Accepted and Projected Capacity (per year for years 1998-2007) in Tons

ID	Type[1]	Municipality	Facility Name	Status	Projected Waste Accepted[2]	1997 Waste Accepted[3]	Bypass	pre-burn metal Recovery	pre-burn nonmetal Recovery	Burned[3]	Post-burn metal Recovery
RR0005.005	MB	AGAWAM	Springfield Resource Recovery	Active	131,400	121,890	2,239	-	77	119,574	2,724
MI0095.006	MI	FALL RIVER	Fall River Municipal Incinerator	Active	52,000	52,121	667	-	-	52,121	-
RR0128.008	MB	HAVERHILL	Ogden Martin Systems / Haverhill	Active	550,000	543,314	188	360	-	538,502	9,932
RR0149.007	RDF	LAWRENCE	Ogden Martin Systems / Lawrence	Inactive	-	245,931	5,323	14,359	-	205,677	-
RR0186.005	MB	MILLBURY	Wheelabrator Millbury	Active	490,000	467,409	-	132	-	470,101	2,785
RR0210.001	MB	NORTH ANDOVER	Massachusetts Refusetech Inc	Active	440,000	399,755	-	-	-	401,255	10,504
RR0216.005	MB	PITTSFIELD	Energy Answers Corp Pittsfield	Active	78,500	76,794	2,905	663	1,775	77,232	1,843
RR0250.002	RDF	ROCHESTER	SEMASS Resource Recovery	Active	964,752	1,000,287	5,002	20,816	26	962,662	21,750
RR0262.006	MB	SAUGUS	Wheelabrator RESCO	Active	440,000	440,417	-	-	-	439,647	19,084
				TOTALS:	3,146,652	3,347,918	16,324	36,330	1,878	3,266,771	68,622

[1] Ash generation is related to the type of combustion process; Refuse Derived Fuel (RDF) leaves 16% of the original waste as ash, Mass Burn (MB) 25% as ash, and Municipal Incinerators (MI) also 25% as ash.

[2] Ogden Martin / Lawrence operated for 5 months or 105,000 tons during 1998. Therefore, the Projected Waste Accepted for 1998 is 3,251,652 and 3,146,652 for 1999-2007.

[3] Discrepancies between Waste Accepted and Burned are a result of Bypass, pre-burn recovery, and waste on the tipping floor at 12:01 AM on January 1, 1997.

Highlighted areas reflect proposed changes from that which was reported in the 1997 Solid Waste Status Report.

Attachment 2

Appendix J
Solid Waste Management
Generation and Capacity Projections

		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total MSW Generation		7,406,186	7,406,186	7,444,672	7,483,158	7,521,644	7,560,129	7,598,615	7,638,101	7,677,792	7,717,689
	Construction & Demolition Waste	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463	3,936,463
	Other	228,731	228,731	228,731	228,731	228,731	228,731	228,731	228,731	228,731	228,731
	Biosolids	10,000	-	-	-	-	-	-	-	-	-
Total Non-MSW Generation		4,175,194	4,165,194	4,165,194	4,165,194	4,165,194	4,165,194	4,165,194	4,165,194	4,165,194	4,165,194
Total Generation		11,581,380	11,571,380	11,609,866	11,648,352	11,686,838	11,725,323	11,763,809	11,803,295	11,842,986	11,882,883
	Combustion Capacity	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652	3,146,652
	MSW Recycling	2,814,351	2,962,475	3,126,762	3,292,589	3,459,956	3,477,659	3,495,363	3,513,526	3,531,784	3,550,137
	Projected MSW Recycling Rate	38%	40%	42%	44%	46%	46%	46%	46%	46%	46%
	MSW Landfill Capacity	742,258	422,232	360,046	276,644	123,786	123,786	123,786	115,691	115,000	115,000
Total MSW Management		6,703,261	6,531,359	6,633,461	6,715,886	6,730,394	6,748,098	6,765,801	6,775,870	6,793,437	6,811,789
	Non-MSW Proc. and Recycling	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000	2,900,000
	Non-MSW Landfill Capacity	1,261,356	202,015	116,164	16,239	6,964	4,914	4,914	2,450	-	-
Total Non-MSW Management		4,161,356	3,102,015	3,016,164	2,916,239	2,906,964	2,904,914	2,904,914	2,902,450	2,900,000	2,900,000
Total Management		10,864,617	9,633,374	9,649,625	9,632,124	9,637,358	9,653,012	9,670,715	9,678,320	9,693,437	9711789.239
	MSW Excess Capacity (Shortfall)	(702,925)	(874,828)	(811,211)	(767,272)	(791,249)	(812,031)	(832,814)	(862,231)	(884,355)	(905,899)
	Non-MSW Capacity (Shortfall)	(13,838)	(1,063,179)	(1,149,030)	(1,248,955)	(1,258,230)	(1,260,280)	(1,260,280)	(1,262,744)	(1,265,194)	(1,265,194)
	Total Excess Capacity (Shortfall)	(716,763)	(1,938,007)	(1,960,241)	(2,016,227)	(2,049,479)	(2,072,311)	(2,093,094)	(2,124,975)	(2,149,549)	(2,171,093)
Tons Per Day	MSW Excess Capacity (Shortfall)	(2,300)	(2,800)	(2,600)	(2,500)	(2,500)	(2,600)	(2,700)	(2,800)	(2,800)	(2,900)
	Non-MSW Capacity (Shortfall)	(40)	(3,400)	(3,700)	(4,000)	(4,000)	(4,000)	(4,000)	(4,000)	(4,100)	(4,100)
	Total Excess Capacity (Shortfall)	(2,300)	(6,200)	(6,300)	(6,500)	(6,600)	(6,600)	(6,700)	(6,800)	(6,900)	(7,000)

Highlighted areas reflect proposed changes from that which was reported in the 1997 Solid Waste Status Report.

ATTACHMENT 3

In Chapter 4 of the 1997 Solid Waste Master Plan Update, and specifically, the "Moratorium Revisions" section on page 4-8, describes revisions to the moratorium that were necessary based on information available at that time. In the Moratorium Revisions section of the Update a description of what the moratorium applied to and what the moratorium did not apply to was summarized. The following is an excerpt from page 4-8 of the 1997 Update, indicating what language changes are proposed (underlined).

The moratorium applies to approval of the following applications:

- Issuance of site suitability reports for landfills until the final CAP regulations are promulgated. Following promulgation, CAP regulations will allocate both MSW and non-MSW capacity if determined to be necessary;

- Permits to construct new or expanded disposal capacity, except as discussed in the section below entitled "Interim Capacity Allocation Procedure" and except as needed for partial replacement capacity indicated from improved disposal capacity data and projections in the proposed 1999 Plan revisions.

- Etc ...

No other changes are proposed to the 1997 Solid Waste Master Plan Update except those indicated in this document and in Attachments 1 and 2.

ATTACHMENT 4

The following, facilities are those that DEP believes meet the criteria to begin the permitting process as described in the proposed amendment to the current Solid Waste Master Plan. Each of these facilities has received a site assignment from the local Board of Health for their proposed expansion areas. The annual tonnage listed for the landfills represent extensions of existing operations without increasing, current annual tonnage limits.

CURRENT UTILIZATION			POTENTIAL REPLACEMENT CAPACITY		
Facility	**Tons Per Day**	**Closure Date**	**Tons Per Day**	**Closure Date**	**Type of Expansion**
Barry	300	07/31/00	300	7/31/12	Existing Cell/Lateral
Chicopee	500	03/31/00	500	03/31/02	Vertical
Fall River	1,500	12/31/99	1,500	12/31/04	Existing Cell
Fitchburg	500	06/30/02	500	06/30/05	Lateral
Granby	400	12/31/99	400	12/31/03	Lateral
Northampton	100	12/31/02	100	06/31/06	Vertical
Total Tons	**3,300**		**3,300**		

The DEP has regulatory authority over landfills and administers them through the Regional Offices. There are separate regulations for solid waste landfills, land application of sludge and septage, incinerator ash and of course, hazardous substances.

The regulations for the disposal of solid waste by sanitary landfill (310 CMR 19:00) are comprehensive and are increasingly being enforced by the DEP. Periodic examinations and evaluations of sanitary landfill operations are made by the DEP and the owners are also required to have qualified sanitary engineers conduct [bimonthly] inspections for regulation compliance. Furthermore, DEP is currently discussing and reviewing a revision of the regulations which would add much greater protection against groundwater contamination.

The regulations for land application of sludge and septic (310 CMR 32:00 dated 11/10/83) are equally comprehensive and have specific water pollution protection sections. For example, no sludge or septage shall be applied within 2500 feet of any public water system or the high water mark of any Class A water with very few exceptions under very stringent parameters. Further, private wells are given a 300 foot radius and groundwater monitoring may be required.

b. Hazardous Waste Sites

Many of the hazardous waste sites can be classified as nonpoint source pollution problems. For this reason reference to hazardous waste sites is made here in the Nonpoint Source Management Plan. The Bureau of Waste Site Cleanup (BWSC) within the DEP manages hazardous waste sites under the authority of M.G.L. Chapter 21E, the Massachusetts Superfund Law. The BWSC is required to publish on a quarterly basis a "List of Confirmed Disposal Sites and Locations to be Investigated." The BWSC manages the various projects as described in the report.

Many of the sites represent past spills, releases or discharges which are now in sediments and threatening to release back into the environment. A well known and large hazardous waste site is the New Bedford Harbor PCB site. This is actually being handled under the federal Superfund Program and is in the remedial action implementation phase.

A lesser known hazardous waste site is that of Atlas-Tack Company located on an estuary of Buzzards Bay in Fairhaven, MA. Apparently a historic process waste discharge from a lagoon has contaminated estuary sediments with cyanide, arsenic and possibly other contaminants. This site has become a candidate for designation as a federal superfund site. The point being made here is that many of these sites, although originally created by way of point source discharges, are now releasing or threatening to release contaminants as nonpoint sources of pollution.

c. Strategy

In terms of a nonpoint source management plan strategy to address landfills it appears that the Solid Waste Master Plan and existing regulations on land disposal do in fact present a progressive plan which is being implemented.

H. HYDROLOGIC\HABITAT MODIFICATION

1. Nonpoint Source Background

- Channelization - maintenance or construction of ditches, channels, rivers, etc., may result in direct discharges of soil and sediment to flowing waters. Non-stable channels, slopes, and spoil material may erode releasing sediments to water. Removal of riparian vegetation may cause temperature increase in downstream areas resulting in stream scouring or even increased flows and flooding.

- Dam Construction/Reconstruction - earth moving and construction activities may result in soil erosion and sediment delivery to waters. Thermal and hydrologic modifications frequently occur where reservoir area or storage is large. Flooding of bogs may result in changes in pH of unbounded waters and release of nutrients.

- Earth Fills - filling of wetlands and other natural storage areas may displace flood storage and alter peak downstream flows. Erosion of unstabilized fill may cause sedimentation in streams and lakes.

2. Regulatory Background

Nonpoint source pollution from this category does not appear to be of major concern in Massachusetts. The assessment report did not identify any water quality problems associated with this category or the following subcategories.

- channelization
- dam construction
- flow regulation/modification
- bridge construction
- removal of riparian vegetation
- stream bank modification/destabilization

a. Dredging

Coastal dredging in Massachusetts may cause certain water quality problems in and around the disposal sites. Two sites often used in the past for coastal dredge spoils disposal have been (a) the "Foul Area" off Massachusetts Bay and (b) a site within Buzzards Bay. Lately some potential coastal dredging projects have been postponed or put on hold due to the characterization of the sediments as containing hazardous waste (e.g., Boston Harbor).

Dredging operations are regulated by the U.S. Corps of Engineers under Section 404 of the Clean Water Act; by local conservation commissions under the Wetlands Protection Act; DEP Regional offices under the Water Quality Certificate requirements; DEP, Bureau of Resource Protection under a Chapter 91 Waterways License; and DEM, Division of Water Resources as trustee for the Ocean Sanctuaries Program under M.G.L., Chapter 132A.

b. Lake Drawdown - Dam Repair

Over the last five years the issue of lake or pond drawdown and dam safety and repair has become an issue of increasing concern to the DEP. These hydrologic modifications may cause ecological harm to wetlands and aquatic life if proper precautions are not exercised. Lake drawdown has recently increased as a means of controlling undesirable aquatic vegetation, especially around popular recreational areas. Due to the concern of the DEP relative to lake level drawdown and dam repair projects a Memorandum of Understanding (MOU) was executed in 1992 between the DEP and the Department of Environmental Management (DEM). The MOU sets out in clear and orderly language the regulatory responsibilities of each agency and administrative policy to avoid conflicting orders, recommendation letters, licenses, and permits from each agency. This MOU has resulted in more responsible lake drawdowns and dam repair projects where both environmental and public safety concerns are guarded. The MOU has also served to ease the burden of red tape bureaucracy upon potential permittees

3. STRATEGY

The Watershed Initiative approach of the core Nonpoint Source Program described in Volume I will result in the identification of nonpoint source pollution problems within each basin. These nonpoint source pollution problems may affect surface water, groundwater or coastal waters. The strategy for hydrologic/habitat modification nonpoint source pollution problems will be as follows:

1. The Teams should determine if the situation can and should be addressed through any other existing regulatory or non-regulatory program. If yes then coordinate with that program and agency to effectively address the problem.

2. If there is no other effective or meaningful programmatic solution then the nonpoint source pollution problem will be evaluated and prioritized by the Team for inclusion in the Watershed Management Plan. This evaluation and prioritization process is the same as that described in Volume I and will include the following information:

   - Water quality monitoring and assessment data from any reliable source.
   - Local and or regional information.
   - The total maximum daily load analysis and implementation plan.

I. ROAD DEICING CHEMICALS

1. Snow and Ice Removal

The original management plan reviewed the general situation relating to the use of road deicing chemicals and nonpoint source pollution relating therefrom. In the intervening time a major document has been prepared on the subject by the Massachusetts Highway Department: Final Generic Environmental Impact Report - June 1992 - Massachusetts Highway Department Snow and Ice Control Program. This report is a thorough review of the subject and makes specific recommendations to alleviate and prevent nonpoint source impacts from road deicing chemicals, especially as it affects groundwater and water supplies.

This Management Plan finds this report to be a major document with specific policy recommendations relating to nonpoint source pollution arising from the use of road deicing chemicals. The basic findings and recommendations of the report are as follows:

EXECUTIVE SUMMARY

ALL REFERENCES TO MDPW SHALL MEAN THE MASSACHUSETTS HIGHWAY DEPARTMENT (MHD)

The Massachusetts Department of Public Works (MDPW) conducts snow and ice control activities on the Massachusetts State highway network. The program entails the use of deicing chemicals and abrasives which create adverse impacts. Due to these impacts, MDPW, in response to the Executive Office of Environmental Affairs (EOEA), has evaluated its snow and ice control program and its environmental, social and economic implications. This Generic Environmental Impact Report presents the following:

- Annual salt use by MDPW has increased during the last 15 years.
- A portion of the increased salt use can be explained by the increase in lane miles maintained by MDPW and by increased traffic volume.
- Reliance on hired spreader trucks significantly contributes to the increased salt use.
- The lack of subcontractor training contributes to increased salt use.
- The lack of sufficient MDPW supervisory personnel, equipment maintenance, and a public education program also contribute greatly to increased salt use.
- MDPW's Material Control System (MCS) was developed as an interactive management tool to monitor salt application rates. The MCS was discontinued in February, 1990 because it was labor intensive and inefficient as a management tool.
- Sufficient data is not available to scientifically relate snow and ice control practices and road conditions to traffic safety.
- Sufficient data is available to comparatively estimate environmental costs, but not to quantify absolute costs.
- Currently, no surface water impacts or impacts to lakes and reservoirs in Massachusetts have been caused by deicing chemicals.
- Sodium contents of some surface water and groundwater drinking water supplies have increased as a result of road salt use.
- The deleterious impacts of sodium chloride will not be significantly reduced if the other sodium chloride users do not incorporate the practices recommended within this GEIR.
- Salt application rates and overall salt use can be reduced if sufficient funds are available for additional state spreader trucks and operators, personnel to monitor road conditions and supervise state and hired spreaders, maintenance of spreaders, public education, and a computerized materials tracking system.
- MDPW should initiate Best Management Practices in Zone II areas as soon as possible and expand these practices state-wide within 5 years.
- As of this writing, the Metropolitan District Commission has not submitted its policy statements to address the recommendations presented in this report.

2. Strategy

It is the recommendation of this Management Plan that a hydrogeologist be assigned to each district within the Massachusetts Highway Department. At least two functions could be served by the hydrogeologists:

One - Each district hydrogeologist could develop a road salt program that was sensitive to water supplies for all state roads within their district, and;

Two - Each district hydrogeologist could work with the municipalities in their district (especially the municipal highway departments and water suppliers) to advise them on treatment of local roads that impact or have the potential to impact water supplies.

V. ENFORCEMENT PROVISIONS

The original Management Plan included a discussion of NPS enforcement provisions which generally focused on the state's surface water quality standards (314 CMR 4.00) with special attention directed to the antidegradation provisions. (314 CMR 4.04). That discussion continues to be relevant to the issue of enforcement as it relates to nonpoint sources of pollution. This updated version of the Management Plan, however, will stress the enforcement approach embodied in the Coastal Nonpoint Pollution Control Plan (Section 6217 of the CZMA Reauthorization Act of 1990).

Congress, when they enacted Section 6217, clearly indicated that Coastal Nonpoint Pollution Control Programs develop enforceable components to back up all nonpoint source control efforts.

The "management measures" approach of the coastal NPS plan is technology-based rather than water quality-based. That is, the Management measures are to be based on technical and economic achievability rather than on cause-and-effect linkages between particular land use activities and particular water quality problems. The "management measures" approach, while patterned to a degree after the point source effluent guidelines technology - based approach, is not expected (nor intended) to have the same level of specificity as effluent guidelines. Section 6217 recognizes that the effectiveness of a particular management measure at a particular site is subject to a variety of factors too complex to address in a single set of simple, mechanical prescriptions developed at the federal level. Thus, the management measures outlined in the "Guidance Specifying Management Measures for Sources of Nonpoint Pollution In Coastal Waters" (the Guidance) will not be directly or automatically applied to categories of nonpoint sources as a matter of Federal law. Instead, it is the state coastal nonpoint program, backed by the authority of state laws and regulations, that must provide for the implementation of management measures in conformity with the Guidance. Under Section 306(d)(16) of the CZMA, coastal zone programs must provide for enforceable policies and mechanisms to implement the applicable requirements of the Coastal Nonpoint Pollution Control Program, including the management measures developed by the state "in conformity" with the Guidance (i.e., the coastal plan).

As stated earlier in this plan, the Massachusetts Coastal Nonpoint Pollution Control Program will be applied state-wide through the Section 319 Management Plan. The coastal plan will analyze all state programs with nonpoint source control responsibilities for their enforceability. The coastal plan will set forth a legislative and/or regulatory agenda, as needed, for appropriate programs to implement the recommended management measures. The coastal plan is appended to and incorporated into this Management Plan. The Department of Environmental Protection, which is charged with the implementation of this Management Plan, pledges itself to support and work toward the passage and adoption of any necessary legislation or regulation as recommended in the coastal plan.

VI. LONG-TERM STRATEGIES

This section is divided into three sub-sections.
For the most part, the first subsection includes the same strategies as the original plan under Section VI. There has been meaningful progress in most areas and slow progress in others. The various bays programs are included in this section with the understanding that they are ongoing long-term strategies that include significant emphasis on nonpoint source pollution. The second subsection constitutes the state's response to EPA relative to Key Element No. 1 as part of this Management Plan upgrade in conformance with the Clean Water Action Plan. The third subsection is the five-year implementation plan and 15-year program strategy for CZM's Coastal Nonpoint Pollution Control Program.

SUBSECTION 1

A. Implement the Massachusetts Watershed Initiative

The Massachusetts Watershed Initiative is a partnership of local communities with state and federal environmental agencies, formed to more effectively solve today's environmental problems. This approach makes sense because the challenges we face today are different than those of just a decade ago. Pollution from industry and wastewater, once the greatest threat to our rivers, has largely been brought under control by tough environmental laws and regulations. Today, we face problems associated with sprawling development and increased per capita use of land and water resources. Many communities are unprepared for such rapid growth resulting in the overuse of our limited water supplies and pollution from widely dispersed sources like storm water runoff from paved areas and failed septic systems.

The Initiative brings together government, business, and citizen partners to prevent and repair environmental pollution in our own backyards and neighborhoods. Each of Massachusetts'' 27 watersheds has a Team that includes representatives from local, state, and federal groups, led by a full-time team leader. By sharing resources, these teams find efficient regional problems facing their communities.

The watershed Teams focus on an innovative five-year management process that is designed to collect and share resources and information, target present and potential impacts to natural resources, assess impacts to natural resources, and develop and implement activities to protect and improve the Commonwealth's natural resources. each year builds on the work of the previous year. Annual Work Plans are developed with active team involvement and serve as a guide for coordinating team efforts. Plans are the building blocks of the more comprehensive Five-Year Watershed Action Plan. Action Plans influence state and federal grants and loans, regulatory decision-making, and education/technical assistance programs to solve the most important environmental problems affecting communities.

The following examples illustrate how the Initiative coordinates state agency, town, and watershed association planning efforts and focuses them on top priority areas within each watershed. The Watershed Team partners with local organizations and citizens, set concrete and achievable Environmental Targets for each watershed. State revolving funds and grants, federal and private resources, and existing state and local resources are focused on achieving desirable environmental outcome.

- The Ipswich Watershed Team is designing water management strategies to solve the low flow problem that has made the Ipswich River one of the most endangered rivers in the nation. This study will determine the levels of flow needed to sustain aquatic life and will be a model for many rivers in the state.

- The French/Quinebaug Watershed Team and the DEM Office of Dam Safety are evaluating all the dams in their watershed to determine their hazard rating and identify those most in need of repair. They are also analyzing other issues associated with these dams including flooding, wetlands, fish habitats, hazardous sediment deposits, private/public wells, and beaches. This study will help to create a model that can be used to reduce impacts from other dams across Massachusetts.

- The Hoosic Watershed Team, in partnership with the Regional Planning Agency, is implementing a watershed-wide education program to teach municipal officials about polluted runoff and how to avoid future problems. The program will help communities develop local by-laws, which can be shared with cities and towns in other watersheds.

- The Westfield, Farmington and Housatonic Teams, working with the Regional Planning Agency, have created a regional lakes and ponds organization to pool the resources of local lakes associations so that the best techniques for protecting and restoring lakes are understood and available.

- In the Shawsheen Watershed, a grass roots organization received an Initiative Grant to create a watershed association. They have created a strong organization that brings communities together to improve conditions in the watershed. The Association has monitored water quality, mapped storm drains, located pollution "hot spots," organized river clean-ups and helped towns' complete open space plans.

- Local Sudbury-Assabet-Concord organizations received an Initiative Grant to form the SuAsCo Watershed Community Council. This Council provides a forum for community partners to coordinate their efforts and solve problems affecting cities and towns in eastern Massachusetts. Stream teams have been formed across the watershed and they organized workshops for municipal officials on pollution reduction.

- The Middlesex Conservation District and the Organization for the Assabet River, in cooperation with the SuAsCo Watershed Team, and SuAsCo Community Council, are sponsoring a series of workshops for municipalities and businesses on controlling costly phosphorus pollution to the Assabet River.

- The Taunton River, French/Quinebaug, and Cape Cod Watershed Teams are partnering with the Cape Cod Commission, University of Massachusetts, and local communities to identify and map sensitive watershed and habitat resources using computer mapping so that limited resources can be focused on the most critical resources.

- The South Coastal Watershed Team is providing technical assistance to their towns by completing a stream-mapping project. During the winter and spring months the South Coastal watershed supplies water from snowmelt and rainwater to brooks and streams. During the summer and fall seasons the upper reaches of small waterways dry up and they are difficult to see. By mapping these tributaries local Conservation Commissions can protect them from the impacts of development.

- The Ten Mile River Watershed Team is working with the Regional Planning Agency, municipal officials, and planning staff in six communities to develop a regional approach to open space protection. These plans identify critical land parcels to protect so limited resources and land-use protection efforts can be focused on the most sensitive resources in the region. This approach will be applied in eight other watersheds beginning in the fall of 1999.

- The North Coastal Watershed Team is partnershiping with the Coastal Zone Management agency, the Regional Planning Agency and the diverse groups from several North Coastal communities to find an appropriate method to implement conservation zoning. The method will help to protect sensitive resources and focus appropriate development on less sensitive areas.

- The Initiative, working with the Wetlands Restoration and Banking Program, EPA, and the Gillette Corporation has launched a statewide "Corporate Wetlands Restoration Partnership" which focuses corporate donations to restoring priority wetlands across the state. Thus far, more than a dozen companies have pledged to donate money and staff to restoring the wetlands.

- The Island Watershed Team is working with four state and federal agencies, and the Town of Nantucket to study the water quality in Nantucket Harbor and its relationship to the declining scallop industry. They will evaluate habitat degradation, stormwater pollution, and spawning losses.

- The Blackstone Headwaters Coalition, using federal funds, is working to restore a stream that now exists only in an underground pipe. They are exploring strategies for stream and wetland restoration, and remediation of pollution problems, along a 3,500 foot collapsed culvert portion of Beaver Brook, in conjunction with the City of Worcester

DPW and U.S. Army corps of Engineers.

- The Boston Harbor Watershed Team is coordinating with the Massachusetts Department of Environmental Protection, U.S. Environmental Protection Agency, Neponset River Watershed Association, United States Geological Survey, and the Town of Hingham to Complete an analysis of the impacts of reduced streamflow on aquatic species in the Weir and Neponset River watersheds. This project will develop a practical rapid assessment methodology for determining minimum acceptable flow conditions based on watershed conditions such as fish and macroinvertebrate habitat requirements and the needs of the wetlands.

- The SuAsCo Watershed Team is colaborating with DEP, the Army Corps of Engineers, EPA, and the Organization for the Assabet River to begin a TMDL (Total Maximum Daily Load) study to determine needed reductions in phosphorus levels. Phosphorus is causing seasonal degradation of the Assabet, Sudbury, and Concord rivers.

- The Connecticut, Parker, Ipswich, and Deerfield teams are working with Conservation Districts and the Department of Food and Agriculture to implement livestock fencing projects to reduce agricultural pollution in these rivers. They are working to help farmers reduce animal waste in streams and prevent erosion of stream banks. Workshops for farmers will be held and tours will be led to demonstration farms.

- The Worcester County Conservation district is working with the Nashua and Chicopee Watershed Teams, the Metropolitan District Commission, EPA, and the City of Worcester to teach forest and farm landowners how to improve stewardship of their land. They are providing information on available technical and financial assistance that can help them prevent pollution of public water supplies.

- The Charles River Team is coordinating with EPA, MDC, USGS, and MWRA to finance a study to determine the contribution of stormwater and combined sewer overflow pollution in the Charles River. This will help focus restoration dollars to where they will help most.

- The Millers Team is coordinating with the Army Corp of Engineers, U.S. Geological Survey, and DEP to identify the Source of PCB contamination in the Tully River. This complex project requires close coordination between the agencies, the watershed council, and the local communities.

- In July 1998, President Clinton designated the Connecticut River as an American Heritage River. The Connecticut Watershed Council and the Regional Planning Agency Team collaborated with the other team members and the four neighboring states to prepare the application for the federal government. This designation will enable greater federal and state assistance to improve the Connecticut River.

- The Boston Harbor Watershed Team, Department of Fisheries, Wildlife, and Environmental Law Enforcement, and the Army Corps of Engineers are working on a project to open fish passage at two dams on the lower Neponset River. The dams are a major barrier to anadromous fish and block access to twenty river miles of prime fish habitat. This project will study the problem at the watershed scale, make recommendations for a phased solution, and implement fish passage projects at both dams.

- Massachusetts received an additional $1.3 million in federal funds to solve pollution problems as a result of the Watershed Initiative. Team priorities will help guide the expenditures of these funds. The Federal Clean Water Action Plan program encourages states to adopt grassroots approaches to solving pollution, of which the Initiative is a national model.

- The Buzzards Bay team, in its outreach year, is supporting the expansion of the Westport River Watershed Association, the launching of a broad-based school education program, and the expansion of the Regional Community Congress to include broader environmental issues.

- The Boston Harbor Team, in the research year, is coordinating water quality, flow, and habitat studies with state, federal, and private expertise so that solutions can be focused on the highest priority sites.

- The French/Quinebaug Team, in its outreach year, is working with the Heritage Commission, University of Massachusetts, Nichols College, and the local Regional Planning Agency to involve communities in solving local

problems so that protection and restoration efforts will gain broad-based support.

- ❖ The Housatonic River Restoration, Inc. is developing a restoration plan for the river, following the government's negotiated settlement with General Electric Company. HRR, Inc. is a broad-based coalition of environmental, conservation, and political entities from throughout the watershed, representing a united public voice. Restoration planning has included 18 public hearings with 500 persons from Pittsfield and neighboring towns. The goal of HRR, Inc. and the Watershed Team is a fishable, swimmable river through its participation in effective application of Natural Resource Damage of the GE settlement funds.

- ❖ Forums to involve the general public have been held in the Westfield, SuAsCo, French/Quinebaug, Connecticut, Nashua, Taunton, and Merrimack watersheds. These events have involved hundreds of participants and allow time for people to give their ideas on how to better protect and restore valuable watershed resources.

B. Title 5 Regulations For The Subsurface Disposal Of Sanitary Sewage (Septic Systems)

The original management plan indicated that the Title 5 regulations (310 CMR 15.00) would be evaluated and revised to address a variety of environmental concerns. This lengthy process was completed on September 23, 1994. The importance of these regulatory revisions cannot be overstated. The formal process of revising the Title 5 regulations generated considerable interest among local Boards of Health (i.e., municipalities) builders, developers, homeowners, environmental groups, state agencies, landowners, etc. As documented in the updated Assessment Report, septic systems have a pervasive, widespread potential to cause nonpoint source pollution to the waters of the Commonwealth.

Title 5, the State Environmental Code for Subsurface Disposal of Sanitary Waste (310 CMR 15.00), was last revised in 1978. Since then, scientific studies have significantly changed our understanding of the environmental impacts of septic systems on groundwater and surface water. In Massachusetts, where nearly one-third of all sanitary waste is disposed of on-site, and nearly half of all those systems are sub-standard, on-site wastewater disposal ranks among the top four sources of river pollution and has contributed to shellfish bed closures, and pollution of water supplies and lakes and ponds. The mounting evidence regarding environmental impacts associated with septic systems prompted the Department of Environmental Protection (DEP) to undertake a comprehensive review of Title 5.

Following is a summary of the major changes in the revised Code.

System Inspection

The revised Title 5 regulations require on-site sewage disposal systems to be inspected:

- When a facility is to be sold to new owners, or there otherwise is a transfer of title, except between spouses;
- when facilities are divided or combined together;
- when there is a change in use or an expansion of the facility;
- for large systems (10,000 gallons per day or more), shared systems, and systems on a condominium with five or more units, on a periodic basis; or
- when DEP or the local approving authority orders an inspection.

Environmentally Sensitive Areas

On-site systems only partially treat wastewater. The impact of septic systems on groundwater resources is well documented, including studies conducted by the US Environmental Protection Agency and the US Geological Survey. And DEP's own data shows that septic systems are a major source of surface water pollution state-wide. Allowing the use of septic systems with no consideration for their cumulative impacts and long-term maintenance can result in significant pollution of groundwater and surface water. DEP included septic system density requirements and nutrient loading standards to protect the most sensitive environmental areas. The nutrient sensitive areas include water supply Zone IIs, Interim Wellhead Protection Areas, lots served by on-site systems and wells, and nitrogen sensitive embayments.

Inspection & Maintenance (I&M)

Routine I & M is essential to the long-term performance of all septic systems to prevent threats to public health. The DEP included an expanded system of certified inspectors, which will facilitate participation from the private sector and will clarify that the principal responsibility rests with the owner.

DEP recognizes there are associated expenses with I&M and repair and is developing ways to assist communities and homeowners. DEP has instituted or facilitated a number of financing options, including the creation of homeowners septic system low interest loan programs, the potential use of tax credits, the so-called "betterment bill," and the use of fees collected by local Boards of Health under existing authority. Over the life of an individual system, a small fee for proper inspection and maintenance can avoid very costly system replacement.

Innovative/Alternative Technologies

DEP increased the use of approved alternative and innovative technologies including humus/composting toilets and recirculating sand filters under certain conditions: remediation, upgrade, and repair of existing systems and, for new construction, on property otherwise buildable under the applicable Title 5 standards. DEP is developing clear procedures and shorter timelines for expediting the approval of new technologies and is currently reviewing several proposals. A planning period is proposed for appropriate field testing and evaluation in actual operation. If successful, alternative technologies will be approved for broader use with appropriate environmental, institutional, and operational controls to ensure protection of public health and the environment.

Community Systems and Cluster Development

A community system will permit multiple buildings on separate lots to connect into a common septic system. This option may be available for both new construction and remediation. The revisions allow homes to connect into a community septic system and establish a standard set of institutional controls to address long term system operation and maintenance, replacement and repair. DEP supports cluster development which allows for the concentration of development in one portion of a site while leaving the remainder as open space, thereby reducing overall impact on natural resources.

Site Suitability and Percolation Rate

A suitable site for sewage treatment and disposal must contain soils capable of providing adequate treatment. Site evaluation typically involves a systematic field investigation to assess topography and soils. The existing requirements for site evaluation and the witnessing of percolation testing are inadequate to ensure the proper siting and design of on-site systems in less permeable soils.

DEP did not incorporate changes to the existing percolation rate but will consider a series of measures to work towards a soils-based system as follows:

- The regulations contain effluent loading rate design criteria for leaching systems based on soil types, perc rate and other factors;

- DEP will continue to offer a training course and a site evaluator certification program to increase the expertise of persons evaluating sites for on-site systems;

- DEP will replace or augment the percolation rate with a soils-based system.

- The proposed regulations provide for a loading rate up to 60 minutes per inch for remediation and repair of existing substandard systems. Additionally, DEP will select a limited number of pilot sites for new construction to test this slower perc rate.

The Nonpoint Source Management Plan fully supports the continuing process of implementing the revised Title 5 regulations. As described in Volume I, The Watershed Initiative will support outreach activities to help municipalities implement the revised Title 5 Regulations.

C. SOIL EROSION AND SEDIMENTATION CONTROL LAW

The Nonpoint Source Management Plan supports the long-term strategy to develop and have enacted by the legislature an erosion and sedimentation control law. This support was contained in the original management plan and continues in this updated version. A significant new impetus behind this legislation will be the Coastal Nonpoint Source Control Plan authorized and required under the Coastal Zone Reauthorization Amendments of 1990 (specifically Section 6217). The guidance issued by EPA for the Coastal Plan requires the state to put in place a comprehensive program to address nonpoint source pollution from construction sites or other areas subject to erosion.

There has been for the last several years a proposed bill in the legislature that requires approval of an erosion and sedimentation plan by the local conservation commission for any alteration of more than 10,000 square feet of surface area or alteration of slopes greater than eight percent. The plan would first have to be certified by the appropriate conservation district. This proposed bill will likely undergo revisions to conform to the forthcoming requirements of the Coastal Plan.

The DEP will work with all involved parties to craft an acceptable and reasonable bill to control erosion and sedimentation. Further, upon enactment of such legislation the Nonpoint Source Program will assist in its implementation. This assistance will be through support for technical training workshops/seminars for local and regional officials. This support may be in the form of an on-going demonstration project implemented through the 319 workplan in accordance with the basin schedule of the Watershed Initiative. This support strategy would be coordinated with the help of the State Commission for the Conservation of Soil, Water and Related Resources.

D. STORMWATER RUNOFF CONTROL

There are three areas where the normal way of doing business may be altered to provide stormwater runoff controls: (1) the Subdivision Control Law; (2) M.G.L. Chapter 90 program for state assistance to local communities for road maintenance, repair and improvement; and (3) the laws and regulations relative to maintenance, repair, reconstruction of state, county and federal roads and highways.

In 1996-1997 DEP and MCZM launched a new approach to address stormwater impacts. The approach has several components:

- A policy, establishing uniform performance standards and coordinating the requirements of several regulatory programs;

- The Stormwater Policy Handbook, to promote consistent implementation of the policy and performance standards;

- The Stormwater Technical Handbook, containing technical information about site planning and stormwater management techniques;

- Training, to assist agency staff, conservation commissions and other municipal officials and consultants;
- Financial assistance, through loans and grant; and
- Phased implementation, from policy to regulatory revisions after an evaluation period of one to two years.

To protect the wetlands and waters of the Commonwealth from the adverse impacts of stormwater runoff, DEP issued a Stormwater Management Policy in November 1996, concurrently with its Guidance for the Rivers Protection Act. With the input of the state's Stormwater Advisory Committee, DEP developed the policy to address stormwater impacts through implementation of performance standards under existing environmental protection programs. The Stormwater Management Standards establish clear and consistent guidelines for stormwater management in Massachusetts while streamlining the regulatory process.

The Standards address both water quality (pollutants) and water quantity (flood control) by establishing the level of required controls which can be achieved through the use of site planning, nonstructural measures, and Best Management Practices (BMPs). BMPs reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site. The Standards are designed to meet the stormwater management requirements under various regulator programs, and:

- Prevent untreated discharges to wetlands and waters;
- Preserve hydrologic conditions that closely resemble pre-development conditions;
- Reduce or prevent flooding by managing the peak discharge and volumes of runoff;
- Minimize erosion and sedimentation;
- Reduce suspended solids and other pollutants to improve water quality; and
- Provide increased protection of sensitive natural resources.

For new development and redevelopment, conservation commissions (or DEP on appeal) should implement the Stormwater Management Standards through an Order of Conditions whenever jurisdiction is established under the Wetlands Protection Act. DEP has developed a one-page form for applicants to submit with their Notices of Intent under the Wetlands Act, describing how the project meets the Stormwater Management Standards. If stormwater is managed under the Wetlands Protection Act, DEP will presume that the discharge complies with all other state regulatory requirements

To address existing discharges, DEP will use watershed assessments to identify significant sources of stormwater pollution and require remedial action under the state's Clean Waters Act authority. Existing discharges include municipal storm sewer systems and drainage structures from developed areas with point sources to wetlands or water bodies. Discharges which cause water quality problems may be designated for permits or enforcement.

In addition to new efforts in stormwater management, a variety of grant and loan programs have been established with federal and state funds to help municipalities, counties, regional planning agencies, and nonprofit organizations address stormwater issues at the local and regional level.

1. The Subdivision Control Law (M.G.L. Chap. 41, Section 81K-81GG).

This law is designed to ensure, among other things, that the roads servicing the subdivision are laid out and constructed in such fashion as to provide safe and adequate passage for the public. The subdivision control law is rather strict in its requirements and also requires that local planning boards adopt formal rules and regulations relating to road construction criteria. The concern of drainage, however, also comes under the jurisdiction of the local board of health which has certain approval powers over subdivisions. Historically, the major concern when reviewing subdivision plans was simply that adequate drainage from paved areas was provided. Recently, however, the issue of where that runoff goes has moved to the forefront. Concerns over siltation, sedimentation, eutrophication, aquifer protection, salt runoff and the like are being heard more and more often.

It is proposed that the subdivision control law be reviewed and suggested amendments be recommended which address the issue of stormwater runoff and nonpoint source controls. Many cities and towns currently require environmental impact studies of subdivisions. It is suggested that this process be formalized in the law itself under appropriate and reasonable criteria. In this way definitive subdivision plans would have to show best management practices for preventing or controlling stormwater runoff. This is not to say it is not done now, but it is not done in a consistent, reasonable formal way. Planning boards and boards of health could use the Mega Manual and the Stormwater Management Manual to assist in the review and implementation process.

A related area where appropriate stormwater controls may be implemented is in the site plan review and special permit process for commercial and industrial development normally under the authority of Zoning Boards of Appeal (ZBA). Industrial parks, shopping malls and the like can generate tremendous amounts of stormwater runoff from the paved areas such as parking lots. This area of concern should be reviewed concurrently with the subdivision control law.

The DWM has drafted appropriate amendments to the Subdivision Control Law as specified in the original management plan. This proposed legislation will be forwarded to DEP's legislative office for recommended submittal to the legislature.

2. M.G.L. Chapter 90 Local Road Improvements

In Massachusetts most of the so-called local road improvement is financed by a biannual transportation bond program through M.G.L. Chapter 90 rules and regulations. Cities and towns are allotted funds from the biannual bond issue according to a certain formula.

Much of the local road improvement work constitutes resurfacing or leveling coats of material. Some of the work is more fundamental such as grading, widening, sloping, drainage work and hardtopping. It is suggested that there is rarely much serious thought given to the possible effects of stormwater runoff during the design and implementation of local road improvement projects. The funds provided from the so-called Chapter 90 work are vital and very necessary to maintain and improve the states local road improvement other than normal maintenance.

It is recommended that future biannual transportation bond issue legislation include a binding provision that all local road improvements funded with Chapter 90 money must comply with stormwater management guidance (BMP's) issued by the Massachusetts Highway Department. This guidance, or so-called environmental handbook, is currently under development by the Environmental Section of the Highway Department. The guidance would be consistent with the Stormwater Management Manual developed by the DEP and CZM. In previous discussions the Environmental Section of the Highway Department has indicated that this would be an acceptable process.

It is further recommended that through the watershed Initiative process the basin teams work with the municipal highway departments to adopt and use the Stormwater Management Manual whenever possible and practicable.

3. State, County and Federal Roadwork

Other than local roads there are county, state and federal roads. For purposes of this discussion only the state and federal entities will be considered, since the counties, although legally owning certain roads in fee simple, do not conduct any maintenance or upkeep work on roads which are now maintained by the local governments or the state Department of Highways.

The state does control a considerable number of roads and is responsible for all maintenance, construction and reconstruction of these roads. There are also federal roads, or interstate highways, which the state, under agreement with the federal Department of Transportation, provides for maintenance, construction and reconstruction. The federal highways must be maintained, constructed and reconstructed, according to federal highway regulations and specifications. State roads must be maintained, constructed and reconstructed according to state regulations and specifications.

For state and federal highway work it is the recommendation of this management plan that the stormwater management guidance contained in the environmental handbook (described in 2 above) be implemented. Again, in conversations with the Highway Department, Environmental Section, it is the intent of the Highway Department to do so. This guidance would be consistent with the DEP and CZM Stormwater Management Manual and any additional requirements contained in the Coastal Nonpoint Pollution Control Plan relating to highway runoff (see addendum to this plan).

The Watershed Initiative will continue to work with the Highway Department to implement this strategy. A further impetus to implementing this strategy is contained in the federal Internodal Surface Transportation Efficiency Act of 1991 (ISTEA). There are several important provisions of this Act which directly relate to stormwater runoff from highways and soil erosion.

Section 1007 of ISTEA provides for a surface transportation program which includes "transportation enhancement activities". These activities are defined in the Act to include "mitigation of water pollution due to highway runoff". Further, the Act stipulates that 10 percent of funds apportioned to a state under Section 104 (b)(3) for a fiscal year shall only be available for transportation enhancement activities. This allotment of funds is projected to become substantial over the next several years.

Section 1057 of ISTEA includes specific requirements for erosion control guidelines:

SECTION 1057: EROSION CONTROL GUIDELINES

a) Development - The Secretary (of Transportation) shall develop erosion control guidelines for States to follow in carrying out construction projects funded in whole or in part under this title.

b) More stringent state requirements - Guidelines developed under subsection (a) shall not preempt any requirement made by or under State law if such requirement is more stringent than the guidelines.

c) Consistency with other programs - Guidelines developed under subsection (a) shall be consistent with nonpoint source management programs under section 319 of the Federal Water Pollution Control Act and Coastal Nonpoint Pollution Control Guidance under section 6217(g) of the Omnibus Budget Reconciliation Act of 1990.

Clearly, Congress intended a close link between federal highway construction as it relates to nonpoint source runoff and the 319 Management Plan and the Coastal Nonpoint Plan. This management plan applauds that intent and supports any and all efforts to integrate comprehensive erosion control BMP's into highway construction activities.

E. PUBLIC WATER SUPPLY - WELLHEAD PROTECTION PROGRAM AND OTHER PROGRAMS

1. Introduction

Massachusetts has had a strong focus on wellhead protection since the early 1980s. This is due to the heavy reliance on groundwater for drinking water supplies throughout the State. Approximately one-third of the state's population, residing in 280 of the 351 communities, uses groundwater for its drinking water. Also, many of the wells are very vulnerable to contamination since they are constructed in unconsolidated sand and gravel deposits and are less than 100 feet deep. As a result, contamination has occurred in at least one municipal supply well in each of 74 communities; and 174 public supply wells have been closed either permanently or temporarily due to contamination. Most of the wells have been contaminated by volatile organic compounds (91), but other contaminants include pesticides, nitrate, sodium, chloride and bacteria. Because of these circumstances, and the land use patterns in the State, wellhead protection efforts focusing on control of risky land uses were initiated by the Department's Division of Water Supply (DWS) earlier than many other states. Massachusetts' Wellhead Protection Program (WHP), approved by EPA in 1989, was one of the first ten programs to be so approved. From the beginning, the WHP was organized around identifying critical, priority wellhead protection areas and protecting them from contamination through pollution prevention techniques.

2. Designation of Wellhead Protection Areas

Priority wellhead protection areas are Zone I and Zone II to public supply wells. These are the primary recharge areas to the wells. Since public supply wells are located through out the State, DWS does not prioritize well protection by geographic region or by river basin, but rather by each well's recharge area.

The Division of Water Supply (DWS) developed a method of wellhead protection area (WHPA) delineation in 1984, which defines three areas of contribution to wells: Zone I, Zone II and Zone III. For wells that lack an approved Zone II, an Interim Wellhead Protection Area (IWPA) is used until a Zone II can be determined by hydrologic study . The IWPA is a circle with a radius of up to one-half mile around a public well. The radius is proportional to the well’s pumping rate.

Zone I is a circle with a radius of up to 400 feet around a public well. The size of the radius is determined by the pumping rate of the well. The water supplier must own or control, via a conservation restriction, the entire Zone I; and only water supply related activities can occur in the Zone I.

Zone II (for wells pumping 100,000 gpd or greater) is the primary recharge area to a well, and is defined by DEP as the "area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can realistically be anticipated (180 days pumping at safe yield with no recharge from precipitation)."

Zone II delineations must be evaluated and approved by the Department of Environmental Protection (DEP). Currently, there are 367 DEP approved Zone IIs covering 828 wells. DEP currently has consultant contracts underway to complete approximately 210 additional Zone IIs. By the Year 2001 all wells pumping more than 100,000 gpd will have Zone II delineation.

These zones are incorporated into the state-wide geographic information system (GIS) and are available to all system users, as well as by request to the Mass GIS program.

3. Wellhead Protection Program

The focus of protection efforts has been on land use controls in the Zone I and II, or IWPA of all public supply wells, on integration of protection requirements into as many environmental programs as possible, and on education of the public and municipal officials through three main tracts:

- Integration of WHP goals into other state agency programs
- regulations requiring wellhead protection, and
- technical assistance.

a. Integration Into Other Programs

The wellhead protection program is integrated into numerous state agency programs which regulate activities that may have an impact on groundwater. This insures that those elements of the wellhead protection program will remain in place even if DEP is forced to scale back its operation.

1. Integration within the Department of Environmental Protection

- The drinking water program's annual statistical report for public water suppliers requires land use information for well recharge areas, during sanitary surveys land uses in the Zone I are inspected and problems cited for action, and water suppliers are educated about their own habits that may pose risks, such as underground fuel storage within the Zone I. DWS is currently implementing a program to perform comprehensive sanitary surveys. The surveys involve staff from the wellhead protection program and incorporate land use and pollution prevention issues into the water system evaluation;

- no new landfills may be sited within Zone IIs and IWPAs and existing landfills within these areas must close by 1995;

- no sludge landfills in Zone IIs; no application of Type II or III sludge with Zone IIs;

- Zones I and II are DEP priority areas for hazardous waste inspections and enforcement, and waste site remediation;

- DWS coordinated with the impending revisions to Title 5, the State Sanitary Code for subsurface waste disposal, to incorporate Zone IIs as sensitive areas that require special conditions for setbacks, loadings and design;

- hazardous waste tanks in Zone II must have secondary containment;

- no sewer lines within Zone I's unless it is to eliminate a source of pollution to the well; all new sewer lines in Zone IIs must be designed and constructed for maximum water tightness; and new sanitary wastewater treatment facilities which discharge to the ground can be sited in these Zones only if it is not feasible to site them elsewhere;

- transfer stations and resource recovery facilities allowed in Zone IIs only if they cannot be sited elsewhere and careful design and operational standards must be met.

- the drinking water program's implementation of the SDWA Phase II rule allows water systems to apply for waivers from certain testing requirements. The waivers for VOC and pesticides testing are linked to source protection as well as to existing source water quality and presence of high risk land uses. Currently, 1250 water sources, mainly groundwater sources, have met the source protection component of the waiver process.

New wetland monitoring requirements for water supply withdrawals have been established by the Division of Water Supply. The monitoring plans are intended to protect wetlands within the recharge area from desiccation or lowering of groundwater.

2. Integration with Other State Agencies

The State Department of Food and Agriculture restricts the use of specified pesticides in Zone IIs and IWPAs (333 CMR 12.00). In addition, their regulations governing herbicide applications on utility rights of way prohibit herbicide applications within 400 feet of a public water supply well and restrict applications within the recharge areas of wells. DWS reviews all applications to use the restricted pesticides and coordinates with DFA on the final approval. DWS assists and encourages farmers to seek alternative pest management and/or alternative crops.

The Department of Public Safety's (DPS) regulations governing underground storage tanks (USTs) include sections that allow fire chiefs to require secondary containment for new underground heating oil tanks in Zone IIs or IWPAs and to deny the installation of a replacement tank if they determine that it constitutes a threat to a well or recharge area. In addition, DPS does not allow groundwater monitoring wells as the sole method of leak detection, as does EPA. They require "in tank" leak detection methods to insure detection of leaked products before they reach and contaminate groundwater. DEP has worked actively with DPS to encourage environmental protection, and in 1991 their authority to regulate USTs was broadened to include protection of the environment as well as public health, safety and welfare.

b. Innovative Regulations

1. Drinking Water Regulations, 310 CMR 22

The wellhead protection program has a strong regulatory component under 310 CMR 22.21 which ties wellhead protection to approval of new wells, and to permits for withdrawals from existing wells. In July, 1990, the state's regulations governing the development of water supply sources were changed to require the communities to adopt specific land use control measures throughout the Zone II for all new wells pumping 100,000 gpd or greater. These controls must be adopted before the well may be put on line. Non-municipal water departments are required to demonstrate their "best effort" to convince the community to adopt the regulations.

The control measures specified in State regulations (310 CMR 22.21) include prohibiting new:

- underground storage tanks
- landfills
- junkyards
- non-sanitary permitted groundwater discharges
- small and large quantity generators of hazardous waste

The regulations also require restrictive conditions on the following activities within Zone IIs:

- storage of sludge and septage, deicing chemicals, commercial fertilizers, animal manure, and liquid hazardous materials
- earth removal practices, and
- land uses that result in impervious surfaces greater than 15% or 2500 square feet of any lot.

2. Water Management Act, 310 CMR 36

These same land use restrictions and Zone II delineation requirements are also enforced through the Water Management Act for all permitted water withdrawals. These include any new or increased water withdrawals of greater than 100,000 gpd per public water supply system. The permit for the withdrawal requires the system to implement wellhead protection measures within three years.

Currently, 69 public water systems have local land use restrictions which meet DEP standards. Also, at least 174 have an aquifer protection bylaw meeting at least some of DEP's provisions.

3. Underground Injection Control Program, 310 CMR 27

Massachusetts promulgated Underground Injection Control (UIC) regulations in 1982, and in 1989 the program was transferred to the Division of Water Supply (DWS). The program concentrates its efforts in Zone II areas, and focuses on closing shallow injection wells such as commercial or industrial floor drains discharging to dry wells, septic systems and leaching pits, to protect groundwater. This focus was developed through review of the State's database of confirmed contamination sites which showed that vehicle maintenance facilities were involved in one third of the sites. Twenty five percent of these sites (172) were due not to leaking underground storage tanks, but to spills and releases of waste oil, gasoline, brake and transmission fluids, and organic solvents through pathways such as floor drains. In addition, a 1990 survey showed that nearly half of the floor drains in 521 facilities across the state, discharge either directly to the ground via a dry well or leaching pit, or indirectly via a septic tank or leaching field.

The UIC program focuses on inspecting facilities in WHPAs and watersheds, closing illegal floor drains discovered during inspections, as well as on developing a strong public outreach campaign to service stations, local inspectors, and others to gain as much voluntary compliance as possible. All inspections are carried out in conjunction with local officials, usually the BOH agent, so that the local inspector remains as an educated enforcement person after the inspection. The program also worked with the State Plumbing Board to revise the Plumbing Code to allow sealing of floor drains in existing vehicle maintenance facilities, and to require new facilities in WHP areas to connect floor drains to a sewer or to install a tight tank for receiving wastes. This code change strongly reflects the goal of UIC program to gain as much voluntary compliance as possible. The program is now coordinated with the Watershed Initiative and UIC inspections are typically conducted in basins during the assessment phase (Year 3).

By focusing on known sources of contamination, service bay floor drains, and on educating plumbers and building inspectors about groundwater protection, the UIC program furthers WHP integration and outreach efforts.

4. Groundwater Discharge Permitting Program, 314 CMR 5

The Department's discharge permitting program regulates all discharges to the ground other than individual on-site septic systems for sanitary wastes. The assessment for proper siting and potential impact to groundwater is done by the DWS by hydro-geologists working in the same section as the WHP. The reviews are coordinated for consistency with wellhead protection program goals and efforts are made to site discharges outside of Zone II or IWPA boundaries.

c. Technical Assistance

The wellhead protection and surface water supply protection programs have a strong technical assistance element to educate water suppliers and municipal officials about the need for water supply protection, and to facilitate the voluntary adoption of local land use regulations in Zone IIs and IWPAs in communities not subject to DWS wellhead protection regulations.

DEP has initiated two new grant programs: the Wellhead Protection Grant Program and the Technical Assistance Land Management Grant Program. Both programs are designed to assist communities with water supply protection. The first program is open to public water systems with groundwater sources. The second is open to technical assistance providers working with either ground or surface water systems. These programs are funded through the Safe Drinking Water Act State Revolving Fund.

d. Future Wellhead Protection Program Goals

The Wellhead Protection Program is working toward continuing and expanding programmatic goals and initiatives. Most important will be integrating wellhead protection work with the new Source Water Assessment Program. Emphasis will also be placed on increasing the number of Zone II approvals, more technical assistance to small water systems, continued integration of WHP into Safe Drinking Water act implementation strategies, and integrating wellhead protection efforts into the BRP basin strategy (see Volume I).

4. Conclusion

In summary, Massachusetts has developed a multifaceted program for wellhead protection which prioritizes protection efforts on designated wellhead protection areas and institutionalizes protective requirements into many state and local regulations and initiatives, thus drawing on the resources of not only DEP, but many other agencies. In addition to the key elements of cross agency integration, regulations which leverage local implementation and enforcement, and technical assistance, the program takes every opportunity to speak to water suppliers, municipalities, consultants and the public through sponsoring workshops and forums, speaking at waterworks association meetings, municipal trade shows, environmental fairs, and seminars for fire chiefs, bankers, real estate professionals, and the automotive services industry, and by participating on relevant committees.

F. BAY PROGRAMS

1. Buzzards Bay and Massachusetts Bays

Massachusetts has two major bay programs which have been nominated and accepted under the National Estuary Program (Section 320 of the Clean Water Act): the Buzzards Bay Program and the Massachusetts Bays Program. The Buzzards Bay Program was accepted into the National Estuary Program in 1988 and the Comprehensive Conservation and Management Plan (CCMP) was approved in 1992. The Massachusetts Bays Program was accepted in 1990 and the CCMP was approved in 1995.

Section 320 of the Clean Water Act specifies the purpose of the CCMP:

Develop a comprehensive conservation and management plan that recommends priority, corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected.

Each CCMP must have a schedule for the coordinaed implementation of the plan by the state as well as federal and local agencies. The approved Buzzards Bay and Massachusetts Bays CCMPs have identified nonpoint source pollution as the major cause of water quality degradation in the respective estuaries. Thus, it may be fair to say that the CCMP's are, in large part, nonpoint source management plans encompassing their respective watersheds.

The present Management Plan categorically incorporates these CCMP's as action oriented NPS implementation plans. A summary of the Buzzard's Bay CCMP action plan is included here as Table 3. Both plans rely on close cooperation and implementation of action plans with the Department of Environmental Protection. The Buzzards Bay Summary indicates the direct applicability of the action plans to local, state, and federal authorities.

The Buzzards Bay CCMP makes the point that the Bay is a relatively healthy estuary, yet it is in jeopardy from pollution associated with continuing growth and development in its drainage area. The report further states that "Nonpoint sources of pollution, including pathogen contamination and nitrogen loading, brought on by growth and development are the leading cause of habitat loss and water quality declines in most of the Bay." [Executive Summary, Buzzards Bay CCMP, p. 4,5; 1991]. The DEP has agreed to cooperate in several key areas to address this problem (see Table 2):

- ✈ Adopting nitrogen criteria for nitrogen-sensitive embayments in revisions to state water quality standards.

- ✈ Developing a policy in cooperation with EPA and the Buzzards Bay Project for better utilizing the antidegradation provisions of state water quality standards with regard to nitrogen loads to sensitive marine waters.

- ✈ Expanding the Wetlands Conservancy Program to protect existing wetlands in most Buzzard Bay towns.

TABLE 2

DIRECT APPLICABILITY OF ACTION PLANS TO LOCAL, STATE AND FEDERAL AUTHORITIES

ACTION PLAN	LOCAL					STATE			FEDERAL	
	Reg[1] Agn	BOH	Pln Brd	Con Com	OTHER	EOEA	DEP	OTHER	EPA	OTHER
Managing N-Sensitive Embayments	T, P	R	R	--	--	MEPA:P	P,R	--	--	--
Protection Shellfish Resources	--	R	--	--	--	--	--	DMF:F,T	T	FDA:T,P
Controlling Stormwater Runoff	P	R	R	--	--	--	R	DPW:P	R	SCS:T,F
Managing Boat Sewage	--	R	--	--	Harb,P,R,T	P;CZM:P	R	--	--	--
Managing On-Site Systems	P	R	--	--	--	--	P,R	--	--	--
Preventing Oil Pollution	T	--	--	--	Fire:P,R,T, Harb:P,R,T	P,R;CZM:T	R	--	--	USCG:T,R
Protecting Wetlands and Marine Habitat	P	--	--	R	Selectm:P	--	R,T	--	--	COE:P,R
Planning for Shifting Shorelines	--	R	R	R	--	CZM:P,T	R	--	--	--
Managing Sewage Treatment Facilities	--	R	--	--	Selectm:P	P	R	DEM:T	--	--
Reducing Toxic Pollution	--	R	--	--	Selectm:P	CZM:P	R	--	T	SCS:T
Managing Dredging and Dredged Material	--	--	--	--	--	--	P,T	--	--	COE:T

KEY
R = Regulation/Implementation
P = Policy
F = Finance
T + Technical

[1] The Southeastern Regional Planning and Economic Development District has planningfunctions and the T represents their activities. The Cape Cod Commission has both planning and regulatory authority, P represents their activities. The regulatory authority will be used to set policy in specific areas for towns

NOTE: Reg Agn = Regional Agency, BOH = Board of Health, Pln Brd = Planning Board, Con Com = Conservation Commission, EOEA = MA Executive Office of Environmental Affairs, CZM = Coastal Zone Management, DEP = Dept. of Environmental Protection, EPA = U.S. Environmental Protection Agency, Fire + Fire Dept., Harb = Harbor Master, Selectm = Selectmen, MEPA = MA Environmental Policy Act, DMF = Div. of Marine Fisheries, DPW = MA Dept. of Public Works, FDA = U.S.Food & Drug Administration, SCS = U.S. Soil Conservation Service, USCG = U.S. Coast Guard, COE = U.S. Army Corps of Engineers

Source: Buzzard Bay CCMP, Executive Summary, 1991

TABLE 3

MASSACHUSETTS BAYS PROGRAM

DRAFT 1994 CCMP ACTION PLANS

PROTECTING AND ENHANCING SHELLFISH RESOURCES

PROTECTING AND ENHANCING COASTAL HABITAT

REDUCING AND PREVENTING STORMWATER POLLUTION

REDUCING AND PREVENTING TOXIC POLLUTION

REDUCING AND PREVENTING OIL POLLUTION

MANAGING ON-SITE SEWAGE DISPOSAL SYSTEMS

MANAGING SEWAGE TREATMENT FACILITY

MANAGING SEWAGE WASTES FROM BOATS

MANAGING DREDGING AND DREDGED MATERIALS DISPOSAL

REDUCING BEACH DEBRIS AND MARINE FLOATABLES

MANAGING NITROGEN-SENSITIVE EMBAYMENTS

ENHANCING PUBLIC ACCESS AND THE WORKING WATERFRONT

PLANNING FOR A SHIFTING SHORELINE

MANAGING LOCAL LAND USE AND GROWTH

Note: Not arranged in order of priority
Source: Massachusetts Bays CCMP, Draft, 1994

2. Waquoit Bay

The Waquoit Bay National Estuarine Reserve is one of 21 sites that make up the National Estuarine Research Reserve System. The Reserve is jointly managed and funded by the National Oceanic and Atmospheric Administration (NOAA) and the Massachusetts Department of Environmental Management (DEM). The Reserve is protected as a living laboratory for on-going research aimed at protecting the valuable resources found in and around estuaries. The goals are to promote resource protection, sponsor applied research on estuarine processes, translate research results to policy makers and the public and serve as a model system to other coastal communities.

Research at the Waquoit Bay Reserve has shown that increased nitrogen loading from the watershed is the biggest pollutant in this shallow coastal embayment and its watershed and groundwater recharge area. Research further indicates that one of the largest contributors of nitrogen is on-site septic systems. The Waquoit Bay project has therefore focused attention on the use of various advanced on-site systems which utilize denitrifying technologies.

The Waquoit Bay project is included here because of its research and assessment work that is directly related to nonpoint source pollution of groundwater and, by extension, the coastal waters. The findings from this project can be incorporated into implementation actions by the Buzzards Bay and Massachusetts Bays Programs and other entities such as the Cape Cod Commission.

This Management Plan supports the Waquoit Bay project as it relates to groundwater research and outreach of its findings.

3. Narragansett Bay (Rhode Island)

[Excerpted from Narragansett Bay CCMP, 1992]

The Narragansett Bay Watershed is over ten times larger than the surface area of the Bay itself, and extends well into Massachusetts. In fact, 60 percent of the Bay basin lies within the Commonwealth up to the headwaters of the Blackstone and Taunton Rivers, and 67 of the 100 cities and towns in the Bay basin are in Massachusetts. This geographic and political reality is significant because land use and environmental policies throughout the basin ultimately affect Narragansett Bay.

The Narragansett Bay Program was accepted into the National Estuary Program in 1988 and the Comprehensive Conservation and Management Plan (CCMP) was approved in January of 1993.

It is important to realize that the five highest priority goals of the Narragansett Bay CCMP strongly rely on a cooperative effort between the state of Rhode Island and the Commonwealth of Massachusetts. For this reason the Narragansett Bay CCMP is incorporated into this NPS Management Plan. Table 4 lists the highest priority actions for immediate implementation.

TABLE 4

NARRAGANSETT BAY CCMP

HIGHEST PRIORITY ACTIONS FOR IMMEDIATE IMPLEMENTATION

RECOMMENDED ACTION	IMPLEMENTING AUTHORITIES	GOAL NUMBER					COST BY YEAR		IMPLEMENTATION STATUS
		1	2	3	4	5	92-93	93-94	
Adopt legislation requiring municipalities to establish wastewater management districts and amend existing regulations governing siting, design, construction, and maintenance of on-site sewage disposal	RIDEM, MADEP, CRMC, RIDOP, Municipalities or utilities, e.g., WWTFs	X					95,000	0	Estimated cost is for dev'pt of OSDS regulations. Estimated first year cost to establish WWMD is $150,000, recoverable
Implement a marina pump-out facility siting plan for Narragansett Bay that includes a consistent written policy for (1) regulating the construction of marinas, docks, and mooring fields; and (2) enforcing prohibitions against boater discharges in Narragansett Bay.	RIDEM, CRMC, Municipal and private boating facilities	X					45,000	0	Cost estimate includes RIDEM-CRMC coordination efforts. Estimated cost of installing pump-outs ($11,500) is not included.
Develop guidance for municipal officials regarding (1) "Best Management Practices" to control nonpoint source pollution, (2) innovative, environmentally protective land management and growth management practices, and (3) development of local and regional stormwater management plans to reduce or treat storm runoff.	RIDEM, MADEP, CRMC, MACZM, RIDOP, EPA, USDA, NOAA, RI AND MA Cooperative Extensions	X					111,000	111,000	Some funding may be available from EPA, NOAA and USDA through CWA Section 319, CZMA Section 6217, and USDA SCS nonpoint source control initiatives.
Develop statewide Critical Resource Protection Policies that include (1) objective criteria for designating critical resources and critical resource protection areas, (2) a Geographic Information System-based mapped inventory of identified resources, and (3) regulatory and non-regulatory controls for protecting identified critical resources.	RIDEM, MADEP, CRMC, MACZM, RIDOP, Municipalities		X				180,000	105,000	Some external federal funding may be available in 92-93 to initiate policy development.

TABLE 4 (Continued)

RECOMMENDED ACTION	IMPLEMENTING AUTHORITIES	GOAL NUMBER					COST BY YEAR		IMPLEMENTATION STATUS
		1	2	3	4	5	92-93	93-94	
Prepare a Special Area Management (SAM) Plan for Greenwich Bay.	CRMC, RIDEM, RIDOP, munic.		X				150,000	100,000	$150,000 may be available for preliminary Greenwich Bay Plan.
Develop species-specific management plans for managing (1) commercially, recreationally, and ecologically important fish and shellfish; (2) all threatened and endangered estuarine-dependent plants and animals; and (3) the re-introduction of native and catadromous fisheries to Bay tributaries, wherever possible.	NOAA, USFWS, RIDEM, MADFW			X			N/A	N/A	No cost estimate prepared. Quahog Management Plan is highest priority.
1) Revise existing municipal and industrial discharge permits to include enforceable, numeric, and chemical-specific limits for all toxic chemicals listed on the Narragansett Bay "List of Toxics of Concern," 2) enforce compliance with these revised discharge limits, and 3) include other significant non-industrial sources of toxic chemicals in these regulatory programs in order to meet state water quality goals for state waters.	EPA, RIDEM, MADEP, WWTFs				X		50,000	62,500	Costs estimated only for state permitting and enforcement efforts. WWTF costs are recoverable form user fees, and are not presented.
Continue efforts to abate the combined sewer overflows (CSOs) in Mount Hope Bay and the Providence and Blackstone Rivers in accordance with a state-wide CSO abatement priority ranking system.	EPA, RIDEM, MADEP, NBC, City of Fall River				X		15,192,500	19,732,000	Primarily planning and design costs. Major capital construction costs begin in 94-95.

TABLE 4 (Continued)

RECOMMENDED ACTION	IMPLEMENTING AUTHORITIES	GOAL NUMBER					COST BY YEAR		IMPLEMENTATION STATUS
		1	2	3	4	5	92-93	93-94	
Establish a Narragansett Bay Implementation Committee, a Narragansett Bay Policy Committee, and a Narragansett Bay planning section to oversee CCMP implementation.	NBP Executive Committee, NBP Management Committee					X	270,000	270,000	Some external federal funding available in 92-93 and 93-94 to begin implementation.
Implement a long-term monitoring program for Narragansett Bay	RIDEM, MADEP, EPA, NOAA, RIDOH, MADPH					X	250,000	250,000	Coordination of on-going programs will offset projected cost.
TOTAL COST							16,343,500	20,630,500	

SOURCE: Narragansett Bay CCMP, 1992

G. CAPE COD COMMISSION - SOLE SOURCE AQUIFER PROTECTION

The Cape Cod Commission is a county planning and environmental agency with the power to regulate and review large land use proposals. The mandate and work of the Cape Cod Commission is included here because of its significant potential to regulate and control nonpoint source pollution on Cape Cod - a sole source aquifer area. The reader will also recognize the linkage between the Cape Cod Commission's work and the research conducted at the Waquoit Bay Reserve. It is also highlighted here as a method of controlling land use (and thus NPS pollution) on a watershed basis. The following discussion borrows freely from a recent article titled "Watershed Protection: A Cape Cod Perspective on National Efforts" by Edward M. Eichner in Environmental Science and Technology (Vol. 27 No. 9, 1993).

The Cape Cod Commission was created by legislative act in 1990 in response to perceived "out of control" development. The act specifically states in Section 1:

... with authority to prepare and oversee the implementation of a regional land-use policy plan for all of Cape Cod, to recommend for designation specific areas of Cape Cod as districts of critical planning concern, and to review and regulate developments of regional impact.

In 1991 the Commission finalized the Regional Policy Plan (RPP), a detailed framework and strategy for gathering information necessary for watershed delineation and protection. The RPP addresses the conflicting needs of water quality preservation and wastewater disposal by identifying the water resources of concern, establishing watershed specific standards that development proposals must meet, and establishing a system for obtaining the information required to protect the resources and equitably allow development in the watersheds.

The Commission targeted nitrogen as the key parameter on which land use intensity in watersheds will be limited. For those areas where data indicates that the nitrogen loading does or will exceed an ambient limit of 5 PPM within a wellhead area, the Commission requires that development proposals show how water quality can be improved or show that the development will not cause a net addition of nitrogen. What this generally translates into is that the developer must implement BMP's in the development to prevent or control nitrogen loading. In appropriate situations, the Commission may require increased minimum lot sizes or the purchase of developable land for open space.

Coastal water standards are based on the individual surface water flushing characteristics of each embayment. This method of watershed protection depends on having reliable nitrogen loading and land-use data. This, of course, is the linkage with the Waquoit Bay project. The Commission is still young and continues to refine its methodology. It is, however, a watershed approach to controlling major land develop schemes for the purpose of protecting or restoring water quality.

This Management Plan supports the work of the Cape Cod Commission as it relates to land-use planning and the implementation of BMP's to control nonpoint source pollution.

H. RIVER PROTECTION ACT

The continued implementation of the Rivers Protection Act, which became law in 1996, is a long-term strategy of this plan. The Rivers Protection Act may be viewed as an extended buffer strip protecting all of the state's rivers from nonpoint source pollution. It doubles the Wetlands Protection Act jurisdiction along rivers from 100 to 200 feet. A brief summary of the act follows:

PURPOSE – To protect the interests of public and private water supply; groundwater; provide flood control; prevent storm damage; prevent pollution; protect the fisheries; protect wildlife habitat; protect land containing shellfish.

JURISDICTION – The Rivers Protection act amends M.G. L. Chapter 131, Section 40 (the Massachusetts Wetlands Protection Act) to include a new wetlands resource areas known as "riverfront area."

RIVER – Shall mean a natural flowing body of water that empties to any ocean, or other river and which flows throughout the year.

RIVERFRONT AREA – Shall mean that area of land situated between a river's mean annual high water line and a parallel line located 200-feet away, measured horizontally from the river's mean annual high water line.

However, the Riverfront Area is 25-feet in:

- Municipalities with a population of 90,000 people or more;
- municipalities with a population density of greater than 9,000 people per square mile;
- areas designated by the Secretary of the Executive Office of Environmental Affairs as a "densely developed area"
- certain identified land within Waltham and Milton .

The municipalities with a population of 90,000 or more people or a population density of 9,000 people per square mile (according to the 1990 U.S. Census) are:

Boston	Everett	Malden	Winthrop
Brockton	Fall River	New Bedford	Worcester
Cambridge	Lawrence	Somerville	
Chelsea	Lowell	Springfield	

PERMIT REQUIREMENTS – Any activity within a "riverfront area" must file a Notice of Intent with the local Conservation Commission within that city or town (see "Exempt Activities and Projects" described below).

REVIEW STANDARDS FOR PROPOSED PROJECTS – Two standards are specified in this Act. First, no permit shall be granted for work in the Riverfront Area that would result in a significant adverse impact on the Riverfront Area for the eight purposes. Second, no permit shall be granted if there is a practicable and substantially equivalent economic alternative to the proposed project with less adverse impacts to the eight purposes.

MEAN ANNUAL HIGH WATER LINE – With respect to a river is the line apparent from visible markings or changes in the character of soils or vegetation due to prolonged presence of water and which distinguished between predominately aquatic and predominately terrestrial land. The mean hightide line shall serve as the mean annual high water line for tidal rivers.

EXEMPT ACTIVITIES AND PROJECTS:

- Activities that are currently exempt from the Wetlands Protection Act (e.g., agriculture, aquaculture, forestry, mosquito control projects);

- The following areas, activities, or structures in existence as of August 7, 1996: any excavation, structures, clearing, driveways, landscaping, utility lines, rail lines, publicly owned airports or marine cargo terminals, bridges over two miles long, septic systems, or parking lots;

- Work that has begun on or before November 1, 1996 for the expansion of any structure, airports and marine cargo terminals owned by a political subdivision;

- Projects that have prepared and submitted on or before November 1, 1996 a draft environmental impact report pursuant to MEPA, MGL c.30 §62B. (DEP may grant an extension of this time limit at the written request of the applicant and for just cause);

- Projects for which a building permit has been filed on or before October 1, 1996 and the permit has been granted on or before April 1, 1997. The conservation commission may grant one extension of no more than 60 days upon written request of the applicant and for just cause);

- Projects for which a building permit has been filed on or before October 1, 1996 and the permit has been granted on or before April 1, 1997. The conservation commission may grant one extension of no more than 60 days upon written request of the applicant and for just cause;

- Projects for which a definitive plan has been approved or endorsed on or before August 1, 1996 pursuant to subdivision control law, MGL c.41 §81U;

- Activities subject to a protective order pursuant to MGL c.21 § 17B, the Scenic Rivers Act;

- Activities associated with wastewater treatment plants and their related structures, conveyance systems and facilities;

- Activities subject to a Chapter 91 Waterways license or permit, or authorized under Chapter 91 by a special act prior to 1973;

- Any riverfront area that is now or formerly associated with historic mill complexes including but not limited to mill complexes in Holyoke, Taunton, Fitchburg, Haverhill, Methuen, and Medford; or

- The renovation of cranberry bogs that have been abandoned since 1959 on property currently in agricultural use.

I. OUTREACH THE MEGA MANUAL

It is a long-term strategy of this plan to continue the outreach of the Massachusetts Nonpoint Source Management Manual, commonly referred to as the Mega Manual. The purpose of this manual is to provide basic information to local officials on how to identify, inventory, and control nonpoint source pollution sources through environmental planning, local bylaws, and regulations. The manual will help guide and encourage local officials to use their authority to take effective action to protect natural resources.

The Mega Manual has been through two (2) printings and every city and town received at least one copy. A third printing of an updated edition of the Mega Manual is planned for the near future. Copies of the updated edition will then be distributed to the Watershed Teams for outreach efforts in the Watershed Initiative.

J. ADOPTION AND IMPLEMENTATION OF THE POLICY FOR A NUTRIENT LOADING APPROACH TO WASTEWATER PERMITTING AND DISPOSAL.

This policy has nonpoint source applicability because it affects septic systems and land use.

Nutrient loading analyzes how a sensitive receptor responds to the introduction of contaminants and what the threshold limits are (in terms of mass) before any degradation in quality is realized. Once these limits are determined, a discharge to the receptor cannot exceed that mass. Conventional DEP permitting practice has relied on maximum concentrations as a permit limits The conventional approach implies that regardless of flow, a standard level of treatment (i.e., a standard maximum concentration) is adequately protective of any resource. In contrast, a permit based on the nutrient loading approach would be tailored to the unique characteristics of a given receptor(s) impacted by the wastewater discharge.

To date, DEP has required groundwater discharges permitted pursuant to 314 CMR 5.00 to meet effluent limits at the point of discharge. DEP recognizes that the existing effluent limit of 10 mg/l nitrogen at the discharge point may not fully account for the resulting impacts to nitrogen sensitive receptors or the cumulative effect of the discharge and that of other sources. The purpose of this Policy is to allow permittees the option of demonstrating the compliance of their discharge with 314 CMR 5.00 through an alternative nutrient loading approach that establishes an ambient nitrogen concentration for the overall site that cannot be exceeded at any down-gradient wells located at the property boundaries. To accomplish this, DEP will utilize a compliance point down-gradient of the point of discharge in monitoring wells at the property boundary. DEP believes that this nutrient loading approach represents a protective, more comprehensive means of assessing and addressing the impacts of the discharge on the ambient groundwater quality, particularly with respect to nitrogen sensitive receptors, that also affords permittees greater flexibility in the use of wastewater treatment technologies.

In addition to total nitrogen, other variables that may significantly affect groundwater quality have historically been overlooked in the groundwater permitting process. Land uses associated with the discharge may have a great impact on groundwater quality by influencing the type and amount of nutrients introduced to groundwater. For example, golf courses, fertilized residential lawns, and ball fields are known to elevate nitrogen levels in groundwater. Recharge rates, (i.e., how much precipitation as rainfall leaches to the water table) are known to have a significant effect on the concentration of nitrogen in groundwater. Recharge rates are increased by land-uses which entail high amounts of impervious surfaces because evapo-transpiration rates are lower than for vegetated surfaces, and runoff is captured by leaching catch basins or drainage swales.

Together, these land uses make a significant difference in the degree of impact a discharge has on the receiving groundwater quality. The nutrient loading approach is a method of evaluating the loadings and other site characteristics and comparing them with the sensitivity of the receptor. In this way, the nutrient loading approach achieves several benefits:

1) Correlates the discharge to the environmental sensitivity of receptors.
2) Establishes a “level playing field” of environmental impacts to groundwater quality.
3) Accounts for other site-specific sources of nitrogen which are not assessed by conventional groundwater discharge permitting.
4) Improves protection for public water supply wells.
5) Introduces greater flexibility in wastewater treatment techniques and methodologies.
6) Promotes beneficial uses of open space.
7) Allows for “mixed use” of various treatment technologies.

Utilizing the mass loading approach also requires that consideration be given to other contaminants associated with wastewater. Treatment plants remove contaminants other than nitrogen through the use of biological, mechanical and chemical means. In situations where more simplistic treatment mechanisms such as household on-site type systems are employed the contaminant removal capabilities are diminished. Other kinds of contaminants such as volatile organics, frequently present in household items, will not be removed through septic systems and must be addressed in a different way if treatment plants are not employed. To address this, DEP will require permittees to consider household hazardous waste collection programs in situations where treatment

technologies do not remove volatile organics. In addition, all groundwater monitoring programs for facilities utilizing the nutrient loading approach must require sampling for volatile organics.

Phosphorus is a nutrient that is frequently limiting in inland and freshwater environments. Although phosphorus is bound chemically and mechanically to soil particles it may advance due to soil overloading because of large discharges or long-term discharges. It moves slowly as a progressing front, overlapping gradually the larger layer below it. Phosphorus movement can be modeled or estimated using appropriate assumptions in the nutrient loading approach.

The nutrient loading approach embodied in this Policy is offered as an optional approach to compliance with the groundwater discharge regulations in lieu of a conventional groundwater discharge permit by which wastewater is treated to 10 mg/l at a treatment plant. Proponents now have an option of complying with 314 CMR 5.00 by maintaining an ambient groundwater concentration, based on total maximum nitrogen load, of 5 mg/l in NSAs, or 10 mg/l in non-NSAs, monitored for compliance at down gradient wells. This policy does not alter proponents ability to apply for a conventional groundwater discharge permit. Consistent with its existing authority, DEP may evaluate the impacts of conventional treatment plant discharges on sensitive receptors to assess whether more stringent discharge limits are warranted.

This Policy applies to all types of entities and facilities applying for groundwater discharge permits, existing permit holders, large systems and permittees proposing expansions of facilities. For new construction, the Policy shall apply only to discharges in excess of 10,000 gpd. Existing development in Nutrient Sensitive Areas will receive permits with nitrogen limits, either upon renewal of existing permits, or issuance of new permits to un-permitted discharges.

For purposes of the Policy, Nutrient Sensitive Areas will include:

1) Interim Well head Protection Area (IWPAs);
2) Zone IIs;
3) Nitrogen sensitive embayments;
4) Areas dependant on private wells;
5) Zone A's for reservoirs;
6) Site specific ponds, lakes, rivers or wetlands deemed to be nitrogen sensitive by DEP after specific site assessments;
7) Potentially productive aquifers that demonstrate hydrogeologic characteristics and aerial extent that indicate feasibility for public water supply well development;
8) Sole source aquifers; and
9) Other areas deemed sensitive to nutrients by DEP on a site-specific basis. Where warranted, these may include areas sensitive to nutrients other than nitrogen.

Municipal permittees may also employ this Policy, although the methodilogy of the Nutrient Loading approach may require modification to better define the "site" given that municipal sewerage systems collect waste water from a large land area that does not comprise the discharge site. DEP will work with municipalities interested in applying the Nutrient Loading Approach on a case-by-case basis. In cases where the discharge is in a nutrient sensitive area, municipal permittees will be required to assess the effects of nitrogen loadings from wastewater and other sources on the nutrient sensitive area. Such assessment may be included as one component of a Comprehensive Wastewater Management Plan. Depending on the results of the nutrient loading assessment, municipal permittees may also be required to develop and implement appropriate nitrogen controls on a variety of sources using, for example, land-use controls.

The application and requirements of this Policy are described in the following Table.

TABLE 1

Applicability and Requirements of the Nutrient Loading Approach

Nutrient Sensitive Areas

Option 1: Use nutrient loading approach to meet 5 mg/l nitrogen at the property line

OR

Option 2: Build a treatment plant that treats to 10 mg/l.**

Additional Requirements:

+ **New Development**

- Expansions of existing discharges above permitted design flows will be considered New Development.
- Where warranted by impacts to sensitive receptors, more stringent discharge limits may apply to treatment plants.

+ **Existing Development**

- No reduction in level of treatment currently provided.
- Variation from the 5mg/l standard will be considered where historic well data indicates that the discharge does not elevate nitrogen levels in well.
- In watersheds DEP deems at critical stage, loading analysis and more rigorous treatment levels, or, for municipalities, land-use controls may be required.

+ **Discharges to Zone IIs and IWPAs (existing & new development):**

- Treatment plants discharging into an IWPA or Zone II must apply DEP Reclaimed Water Policy.
- Proposed discharges into the IWPA of a PWS require the delineation of the Zone II.
- Discharges over 100,000 gpd or 20% of the well's approved yield will require re-delineation of the Zone II boundaries.
- The DEP Zone II nitrogen loading model must be utilized to evaluate the sites impact on the PWS.
- The site's total ambient loading must not exceed 5 mg/l overall.

Non-Nutrient Sensitive Area

Option 1: Use Nutrient loading approach to meet 10 mg/l nitrogen at the property line

OR

Option 2: Build a treatment plant that treats to 10 mg/l nitrogen.

Additional Requirements:

+ No reduction of treatment level for existing development.

****DEP may use existing authority to impose more stringent standards where required to protect sensitive receptors.**

K. Develop and Implement TMDLS

The state has begun developing TMDLs which will facilitate the recognition of the magnitude of nonpoint source pollution as well as clearly show the need to address nonpoint pollution at its sources. The implementation of TMDLs state-wide is a long-term strategy of the Nonpoint Source Program.

L. Cooperate With Implementation of Section 6217 CZM Coastal Nonpoint Source Plan

Implement the recommendations outlined in the 6217 Plan which received EPA conditional approval in 1997. Specifically, implement as appropriate all applicable 6217 (g) enforceable management measures to protect and restore coastal waters.

SUBSECTION 2

KEY ELEMENT NO. 1

EXPLICIT SHORT AND LONG TERM GOALS,

OBJECTIVES AND STRATEGIES TO PROTECT

SURFACE AND GROUNDWATER

SUPPLEMENTAL SHORT AND LONG TERM GOALS

JANUARY 2000

SUBMITTED TO THE

U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR FINAL APPROVAL OF THE NONPOINT
SOURCE MANAGEMENT PROGRAM
UPGRADE IN CONFORMANCE
WITH THE CLEAN WATER
ACTION PLAN

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
GLENN HAAS, DIRECTOR

INTRODUCTION

On March 17, 1999 the Department of Environmental Protection submitted to the Environmental Protection Agency (EPA) the following package:

The Massachusetts Agenda for an Enhanced benefits Nonpoint Source Program, and

An Assessment of the Massachusetts Nonpoint Source Management Plan Relative to the Nine-Key Elements (revised 1999).

Subsequent to this submittal, the Department, at the request of the EPA, submitted on September 14, 1999 a document titled "Water Program Overview" which attempted to clarify and expand upon the earlier submittals relative to satisfying Key Element No. 1.

On October 26, 1999 the EPA granted conditional approval to the Massachusetts Nonpoint source Management Program upgrade package. The conditional approval noted certain deficiencies in Key Element No. 1 as it relates to explicit short and long-term goals. More specifically, the EPA requested that the Department submit specific short and long-term actions that will be undertaken and to quantify what miles, acres or square miles of waterbodies will become enhanced to the point of meeting water quality standards.

APPROACH

In order to meet the requirements of Key Element No. 1 the Department will rely heavily upon the "State of Massachusetts Proposed Total Maximum Daily Loads (TMDL) Strategy: 1998-2000" dated April 1, 1998. The implementation schedule of this strategy along with specific examples within each water resource category will embody the Department's present submittal.

TMDL STRATEGY

A clear understanding of the causes of impairment is a critical element in the success of efforts to improve water quality conditions and restore designated uses to the waterbody. Development of TMDLs will be scheduled based upon the availability of data identifying the causes of non-attainment and the severity of the existing water quality problem.

The State of Massachusetts is committed to developing TMDLs for all impaired water bodies where TMDLs are needed by the year 2012. To achieve this goal, the Department must effectively allocate resources and rely on all watershed stakeholders to work in partnership. As previously noted, public input and feedback on setting priorities within each watershed as well as on proposed strategies and implementation measures to address water quality impairments is a central component of the State's approach to meeting its commitments of the Clean Water Act over the next decade. Given this, the Department is proposing to utilize the watershed teams to the maximum extent feasible during the 5 year watershed cycle to help prioritize listed waters for TMDL development. Prioritization will be based upon the relative importance of each water body within the watershed, the constituent of concern causing impairment, and the degree to which analytical methods are defined, accepted, and available to achieve problem resolution. The attached spreadsheet (attachment No. 1) provides an estimate of the percentage of TMDLs which will be developed by DEP for each watershed between the year 2000 and 2012 in accordance with the basin cycle. The schedule was developed in recognition that there are two distinct categories of pollutants, those in which DEP believes technical methods are well established for TMDL development (category A) and those which the methods are not well established and which will require further development (category B). A list of pollutants in each of these categories is provided in attachment No. 2. It can be seen when reviewing the spreadsheet that DEP is currently proposing, during the first round of the watershed cycle, to develop a large number of TMDLs for which known analytical protocols are established. Also during the initial years DEP plans to work cooperatively with EPA to establish acceptable methods for conducting TMDLs for those parameters where acceptable methods either currently do not exist or may be questionable. Once acceptable methods are identified and agreed upon with EPA those TMDLs will be developed during the second 5 year watershed cycle.

It should also be noted that as draft TMDLs are developed DEP plans to utilize the watershed teams to obtain stakeholder input on proposed implementation strategies for each TMDL and incorporation of those strategies into the overall watershed management plan for implementation.

The Department's proposed strategy during the next two years is intended to accomplish three primary objectives. First, it builds upon current information and studies previously conducted which qualify for submittal as a TMDL and therefore concentrates on implementation of corrective measures wherever feasible. Second, it includes a pilot program in one watershed to better define data collection needs and TMDL development procedures for a number of specific pollutants of concern. Last, it provides a mechanism to work cooperatively with EPA Region 1 to develop and standardize methods for determining TMDLs for several pollutants for which protocols are not well established. Once developed and agreed to by EPA these protocols will be used to develop TMDLs during the next two cycles of the five year basin schedule.

As previously stated the Department believes that for many impaired waters in Massachusetts, efforts to improve water quality and restore uses have already been initiated in the absence of a formal TMDL. As such these efforts meet the intent of the TMDL goals and objectives. Given this, implementation rather than re-evaluation is of primary importance. To address this issue DEP plans to review approximately 70 to 80 existing lake diagnostic/feasibility studies during the next two years which have been conducted for lakes on the state impaired waters list (303d).A list of those lakes identified for DEP review is attached (attachment No. 3). Following public review, these studies will be submitted to EPA for approval under the TMDL program. In addition, DEP plans to evaluate up to 20 past and present facility plans to determine if they were designed to address water quality limited segments identified on the 303d list .Some examples of activities include recent upgrades to a number of publicly owned treatment works to address nutrient loading and chlorine toxicity issues and bacterial contamination from combined sewer overflows and stormwater discharges. Examples of these plans include Cohasset, South Essex Sewage District, the MWRA CSO study, and the recently completed Blackstone River Initiative.

There are many different types of pollutants causing water quality violations in the Commonwealth. Development of TMDLs to address these pollutants can vary from a simplified dilution calculation to complex water quality modeling. In order to address these issues in a comprehensive and defensible manner it will be critical to work closely with EPA to identify data needs and to develop standardized protocols necessary for future TMDL development. To accomplish this goal DEP is proposing to conduct a pilot program on the Nashua River (in conjunction with EPA) to obtain data and define how TMDLs should be developed. It is hoped that up to eleven TMDLs can be developed for this basin during the next two years (3 pathogen TMDLs on river segments and 8 lake TMDLs).

Also, as previously noted, DEP plans to work cooperatively with EPA during the next two years to develop specific methods for determining TMDLs for all pollutants of concern listed on the state 303(d) list. DEP has categorized those pollutants into two categories, those in which we believe technical methods are considered well developed and need EPA confirmation of our methodology and those needing development and EPA agreement.

In addition to the above, DEP will continue to re-evaluate and strengthen the 303d list. During development of the 303(d) list for submittal to EPA in 1998, DEP recognized that many of the listed waters were either based on limited information or data. Although those segments have remained on the list DEP identified them as segments requiring additional evaluation to determine if they meet required criteria necessary for inclusion on future 303(d) lists.

PROPOSED STRATEGY FOR TYPES OF WATERBODIES

LAKES

Several different problems can affect a lake or pond. The most common are:

- culturally accelerated eutrophication (nutrients)
- nuisance aquatic vegetation (often related to nutrient overloads)
- exotic species (often but not always plant species or algae)

Nutrients: Most ponds and lakes in Massachusetts do not have direct wastewater discharges. Therefore, most of the nutrients enter in runoff and groundwater from the watershed; for some larger lakes, atmospheric loads may have to be considered. Internal recycling of nutrients in the waterbody must be considered as well.

Controls: Title 5 controls, stormwater controls, and informed land use are the major means of minimizing eutrophication beyond that which may occur naturally. These are primarily local issues in Massachusetts. The Commonwealth does own the larger lakes (Great Ponds) in the state, but neither owns nor controls their watersheds.

Implementation Strategy: The strategy is to educate the public to the types of problems and the regulations that do apply and the financial support that does exist. Stormwater performance standards should be applied by conservation commissions through the issuance of local Orders of Conditions under the State Wetlands Protection Act for existing or increased stormwater discharges. Existing discharges can be remediated through a DEP-designation process under the State's Clean Waters Act. Local Conservation Commissions, following both applicable state law and any specific local authorizations, play a primary role in protecting wetlands and thereby any associated open waterbodies as well. Local Boards of Health similarly are the first line of oversight in dealing with subsurface disposal of wastewater from private homes. In addition, the revisions to the State's regulations dealing with septic tanks (Title 5) places additional emphasis on siting requirements and maintenance of existing systems; this latter feature is captured in the inspection of a system required when a property is being sold or transferred. In addition, approved innovative and alternative systems are allowed and encouraged to remediate existing failed systems. All of these programs can be helped financially to some degree through specific aspects of the state's revolving fund (SRF) when done through a municipality. While these programs are state wide and continuous, special attention, such as targeted monitoring and enforcement, can and should be undertaken during the 5 year cycle for watershed planning and implementation based on public input and participation. Priority will be given to funding implementation projects in these watersheds during the appropriate part of the watershed planning and implementation cycle.

EXOTIC AND NUISANCE PLANTS:

Many lakes are afflicted with rampant plant growth. Some of these aquatic plants are native species which are fed by an overabundance of nutrients and some are non-native (exotic) species which have gained access to a waterbody and proliferated in the absence of natural controls.

Controls: Reduction of nutrients is the long term control measure at least for the native species. But in some instances for native species and especially for non-native species, management of the waterbody is the only realistic option. Control measures include a wide range of tools that vary from physical, such as drawdown, to chemical herbicides so long as all controls meet state and federal requirements. Preventing the spread of non-native species is the single most effective control measure for exotic species.

State strategy and controls: The major effort here is to prevent the spread of such plants. While there are regulations governing the importation of foreign plants, many are already established in waterbodies throughout the Commonwealth; the prevention strategy for these plants lies in education and best management practices. Boaters in particular are urged to wash the hulls and clean the propellers of their boats before leaving a waterbody since most

of these plants can be ferried from one waterbody to another. A bill filed in the Legislature would strengthen enforcement of exotic weed transport. For those areas where nuisance and exotic plants are established, management techniques range from chemical controls to desiccation by lowering water levels during the winter. The Commonwealth has issued a review of lake restoration practices (Lakes GEIR) that serves as a guide for control measures.

COASTAL WATERS

The major issue for coastal waters is protection of water quality and habitat especially shellfish. In addition, there is concern that waterbodies with restricted circulation may be adversely impacted by nitrogen (N) loadings--more so from non-point sources given that most of these waterbodies typically do not receive direct wastewater discharges.

Bacteria: The most sensitive use of coastal waters is for shellfish since the highest bacterial quality is required for these areas to be open to the general public. A strong program of water quality monitoring of these areas is practiced by the Massachusetts Division of Marine Fisheries. Harvesting permits and resource management are the responsibility of the community in which the shellfish are located. The state is responsible for those resources in state waters. Because of the high quality of water required, stormwater, whether contaminated with wastewater or not, is a major cause of limiting the amount of open areas for general shellfishing. Wastewater effluents and especially combined sewer overflows have major effects on these resources in specific areas.

Implementation strategy: Having recognized these impacts, both wastewater discharges and CSO controls are aimed at minimizing the adverse impact on shellfish beds. As with other issues, controlling stormwater and non-point sources such as runoff from livestock operations is an even greater challenge since direct regulation of these sources is limited. Therefore, much of the control is based on voluntary programs that require outreach, education and, where appropriate, financial assistance.

Now that most, if not all, point sources and CSOs are being controlled or are part of an overall plan to improve water quality, the emphasis is shifting to efforts to manage non-point sources. These efforts will be maximized during the watershed cycle when a given coastal basin is in its implementation year.

Coastal monitoring must be strengthened and integrated with the Watershed Initiative's 5-year cycle so that data gaps can be filled, priority pollution sources targeted and enforcement actions, such as stormwater designations and continuing and widespread on-site disposal violations, can be remedied.

Nutrients: Nutrients, especially nitrogen, are a concern in coastal waters that have restricted circulation. Few, if any, of these waters in Massachusetts receive direct discharges. However, non-point source loadings, especially from subsurface wastewater disposal units in developed watersheds are a major source. While demonstrating that a waterbody may be adversely affected is not always easy, it is much simpler than predicting when a waterbody will reach a critical point. In the first instance, water quality data are required. Key parameters which may reflect stressed conditions include the loss of eel grass as well as diurnal fluctuations in dissolved oxygen. In the second instance, a predictive tool is required. While some have been suggested and generally involve estimating the annual nitrogen loading, there is no universally accepted tool; this is an area that needs additional development.

The Cape Cod Commission and Menzies Assoc. have secured federal funding, through DEP, to develop nitrogen-sensitive embayment delineation methodologies. Once an approved delineation and loading methods are adopted, Title 5 regulations provide for a mechanism to require stricter on-site wastewater controls through revised Title 5 and Water Quality Standards regulations.

Controls: Reducing and/or controlling N is the major means of avoiding or rectifying problems. While controls on runoff are helpful, the most important source seems to be from subsurface wastewater disposal units. This would also apply to point sources that affect any coastal waterbody identified as suffering from nutrient impacts.

Implementation strategy: Because much of the authority for controlling non-point sources is at the local level, the main strategy for the Commonwealth is to provide the regulatory framework, education, technical assistance, and, where authorized, financial assistance to abate non-point sources of pollution. Within the Commonwealth's

regulations for subsurface disposal (known as Title 5), is the provision to designate a water body as being nitrogen sensitive. Under this designation, control of nitrogen is emphasized. Means of effecting this control include requiring subsurface disposal systems that denitrify their effluents. To date, no such areas have been designated. However, at least three towns do have some guidance for selected areas. Falmouth has town wide guidance for its coastal waters. Bourne and Plymouth have a program to manage N in the watershed of Buttermilk Bay.

In addition to Title 5, storm water regulations (federal) and guidance (state) also exist. Large cities (>100,000 population) and selected industries are subject to the federal regulations on a categorical basis. Other entities in these two groups can be subject if certain water quality impacts are caused by runoff from these facilities or urbanized areas. In general, agricultural activities in Massachusetts are exempt from direct regulation, but receive much attention through voluntary programs the most prominent of which is the Natural Resources Conservation Service, formerly known as the Soil Conservation Service.
Eelgrass bed maps have been completed for the entire coastline of Massachusetts and should be used to help target follow-up monitoring, enforcement, and remediation of pollution sources contributing to the decline of eelgrass beds and hence important shellfish species such as scallops. This will require integration of a coastal monitoring component into the watershed cycle.

RIVERS

Rivers are the waterbodies for which the largest number of TMDLs have been done. Pollutants limits were established for point source discharges mainly to deal with organic impacts caused from biochemical oxygen demand (BOD) and nitrogen oxygen demand (NOD).In addition, seasonal or year around disinfection is required in Massachusetts so that sanitary wastewaters meet the standard for bacterial indicator organisms. Ammonia has been limited beyond NOD in some cases to eliminate it as a toxicant.

While effluent limits for phosphorus have been set for many discharges, there remains no firm vehicle for determining an acceptable loading to a river particularly where impacts are due to macrophyte growth. Dilution calculations have been calculated for selected metals, but need to be re-evaluated since the standard was revised and is now based on dissolved rather than total recoverable metal as defined by EPA.

Controls: Both treatment and pollution reduction/prevention are major controls which need to be employed. Point source treatment levels are determined by the state in a regulatory framework while nonpoint pollution reduction/prevention is based on statewide controls and targeting in Watershed Management Plans for follow-up implementation, primarily at the local level.

Implementation strategy: The state has a primary role in setting water quality standards, establishing and allocating TMDLs and in determining treatment requirements for wastewater effluents. It also pursues education and technical assistance for both POTWs and commercial entities. Pollution prevention and reduction are major aspects for the latter. Training programs for wastewater treatment plant operators also is a major activity of the Commonwealth and is necessary to maximize and maintain treatment efficiency.

These point source traditional methods need to be seriously augmented by the wide range of nonpoint source and non-traditional controls such as those seen in the Neponset Watershed Pilot Project. Fixing leaking sewer pipes, removing illegal sanitary connections to stormwater discharges, erosion/sediment controls, 21E site designations, Title 5 enforcement, and Water Management Act permit modifications are all examples of the types of nonpoint source controls that can be must be implemented to realize water quality gains that go beyond end-of-pipe technology-based command-and-control solutions.

ATTACHMENT NO. 1

PERCENTAGE OF TMDLs DEVELOPED BY CATEGORY

WATERSHED	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
NASHUA, BLACKSTONE CHICOPEE, CONNECTICUT	A- 50%					A- 50% B- 25%					B- 75%		
FRENCH, QUINEBAUG, MERRIMACK, PARKER, BOSTON HARBOR, MT. HOPE BAY, CAPE COD, NARRAGANSETT		A- 50%					A- 50% B-25%					B- 75%	
DEERFIELD, MILLERS, IPSWICH, SHAWSHEEN, BUZZARDS BAR, ISLANDS			A- 50%					A- 50% B- 25%					B- 75%
WESTFIELD, CONCORD FARMINGTON, TAUNTON SOUTH COASTAL				A- 50% B- 25%					A- 50% B- 75%				
HUDSON, HOUSATONIC, CHARLES, TEN MILE NORTH COASTAL					A- 50% B- 25%					A- 50% B- 75%			

ATTACHMENT NO. 2

Category A: Technical Methods Considered Well Developed [1]

1. Pathogens (Bacteria) only
2. Chlorine
3. Excessive Non-Native Plants (exotic species also associated with nutrient enrichment)
4. Excessive Native Plants (nutrient enrichment)
5. Nitrogen & Phosphorus for Lakes
6. Unionized Ammonia

Category B: Technical Methods Needing Further Development/Refinement

1. pH
2. Priority organics
3. Suspended Solids & Dissolved Solids
4. Thermal Impacts
5. Toxicity of Unknown Origin
6. Pesticides
7. Turbidity
8. Silt
9. Oil & Grease
10. Inorganic chemicals including metals
11. Non-priority organics
12. Taste and Odors
13. Nutrients in River System
14. Nitrogen and Phosphorus in coastal waters

[1] The majority of TMDLs required are for constitutes listed in category A.

ATTACHMENT #3

CLEAN LAKES

PROGRAM PROJECTS

APPEARING

ON THE

303(d)

LIST

DEPARTMENT OF ENVINROMENTAL PROTECTION

DIVISION OF WATERSHED MANAGEMENT

1998

CLEAN LAKES PROGRAM PROJECTS
APPEARING ON 303(d) LIST

1998

WATERSHED	LAKE/POND	D/F REPORT	DATE	IMPLEMENTATION REPORT	DATE
HOOSIC	NONE				
HOUSATONIC	Lake Buel: Monterey/New Marlborough			Harvester Purchase and Design of Outlet Control EIR: Seasonal Drawdown and Harvesting	1983 No Report Found 1989
	Onota Lake: Pittsfield	Yes	1991		
	Prospect Lake: Egremond	Yes	1991		
	Stockbridge Bowl: Stockbridge	Yes	1991		
CONNECTICUT	Arcadia Lake: Belchertown	Yes	1985	Septic System Management	1989
	Forge Pond: Granby	Yes	1989		
	Metacomet Lake: Belchertown	Yes	1985	Septic System Management	1989
	Nashawannuck Pond: Eashampton	yes	1986		
	Watershops Pond: Springfield	yes	1986		
MILLERS	Kendall Pond: Gardner	Yes	1989		
CHICOPEE	Dimmock Pond: Springfield	Yes	1988		
	Hardwick Pond: Hardwick	Yes	1993	Flow Control	1989
	Quaboag Pond: Brookfield	Yes	1986	Phase II Report Seepage Report	1994
	Quacumquasit Pond: Brookfield/Sturbridge	Yes	1986		1994
	Upper Van Horn Park: Springfield	Yes	1990		

CLEAN LAKES PROGRAM PROJECTS
APPEARING ON 303(d) LIST

1998

WATERSHED	LAKE/POND	D/F REPORT	DATE	IMPLEMENTATION REPORT	DATE
QUINEBAUG	Big Alum Pond: Sturbridge	Yes	1985		
	Cedar Pond: Sturbridge	Yes	1983		
	Hamilton Reservoir: Holland	Yes	1983		
	Prindle Lake: Charlton	Yes	1990		
	Walker Pond: Sturbridge	Yes	1985	Dredging Project	1990
FRENCH	Webster Lake: Webster	In-House Study		Septic System Management	1988
BLACKSTONE	Indian Lake: Worcester	Yes	1989		
	Leesville Pond: Auburn/Worcester	Yes	1990		
	Lake Quinsigamond: Worcester	Yes	Several In-House and 1981	Several: Stormwater Modelling, Etc.	1972; 1981 1982; 1989
	Lake Ripple: Grafton	Yes	1986		
	Hovey Pond: Grafton	Yes	1979		
	Salisbury Pond: Worcester	Yes	1987		
	North Pond: Hopkington/Milford	Yes	1987		
	Flint Pond: Shrewsbury/Grafton/Worcester	In-House			
TAUNTON	Stetson Pond: Pembroke	Yes	1993	Watershed Management Plan	1982

CLEAN LAKES PROGRAM PROJECTS
APPEARING ON 303(d) LIST

1998

WATERSHED	LAKE/POND	D/F REPORT	DATE	IMPLEMENTATION REPORT	DATE
MYSTIC	Ell Pond: Melrose	Yes	1985	Storm Drain Project	1989
	Spy Pond: Arlington	In-House Diag.			
		Feasibility	1982		
	Wedge Pond: Winchester	Yes	1988		
	Blacks Nook: Cambridge	Yes	1987		
CHARLES	Box Pond: Bellingham	Yes	1990		
	Bullough's Pond: Newton	Yes	1990		
	Halls Pond: Brookline	Yes	1986		
	Hardy's Pond: Waltham	Yes	1986	Final EIR for the Restoration of Hardy Pond	1996
	Jenning's Pond: Natick	Yes	1986		
	Lake Winthrop: Holliston	Yes	1985		
NEPONSET	Lake Massapoag: Sharon	Yes(two of them)	1984 & 1987		
WEYMOUTH AND WEIR	Foundry Pond: Hingham	Yes	1992		
	Lake Holbrook: Holbrook	Yes Final Draft Final	1989 1994		
NASHUA	Bare Hill Pond: Harvard	Yes	1987		
	Harbor Pond: Townsend	Yes	1988		
	Lake Shirley: Lunenburg	Yes	1988		
CONCORD	Bartlett Pond: Northborough	Yes	1986		

CLEAN LAKES PROGRAM PROJECTS
APPEARING ON 303(d) LIST

1998

WATERSHED	LAKE/POND	D/F REPORT	DATE	IMPLEMENTATION REPORT	DATE
CONCORD (Continued)	Boons Pond: Hudson/Stow	Yes	1986		
	Chauncy Lake: Westborough	Yes	1986		
	Lake Cochituate: Framingham/ Natuck/ Wayland	Yes, but not under CLP	1980		
	Dudley Pond: Wayland	Yes	1983	Stormwater Renovation and Harvesting	On-Going as of 1987-1988 (Final Report?)
	Fort Meadow Reservoir: Marlborough	Yes	1987 Revised 1988		
	Long Pond: Littleton	Yes	1991		
	Fawn Lake: Bedford	Yes	1989		
SHAWSHEEN	Forest Lake: Methuen	Yes	1990		
MERRIMACK	Forge Pond: Westford/Littleton	Yes	1987		
	Mill Pond: West Newbury	Yes	1988		
	Knop's Pond (Lost Lake): Groton	Yes			
	NONE		1992		
	NONE				
PARKER	Browns Pond: Peabody	Yes	1989		
IPSWICH	Chebacco Lake: Hamilton/ Essex	Yes	1985		
NORTH COASTAL	Chebacco Lake: Hamilton/Essex	Yes	1985		

CLEAN LAKES PROGRAM PROJECTS
APPEARING ON 303(d) LIST

1998

WATERSHED	LAKE/POND	D/F REPORT	DATE	IMPLEMENTATION REPORT	DATE
NORTH COASTAL (Continued)	Flax Pond: Lynn	Yes for Sluice and Flax Pond	1986		
	Floating Bridge Pond: Lynn	Yes	1986		
	Lake Quannapowitt: Wakefield	Yes	1986		
	Sluice Pond: Lynn	Yes	1986		
SOUTH COASTAL	Billington Sea: Plymouth	Yes	1990		
	Furnace Pond: Pembroke	Yes (Includes Furnace, Little Sandy Bottom and Stetson Ponds)	1993		
	Oldham Pond: Pembroke	Yes (Includes Furnace, Little Sandy Bottom and Stetson Ponds)	1993		
BUZZARDS BAY	Buttonwood Park Pond: New Bedford	Yes	1988		
CAPE COD	Bearse Pond: Barnstable	Yes (Includes Wequaquet and Long Ponds)	1989		
	Great Pond: Eastham	Yes	1987	Implementation for Ground Water and Aquatic Plants	1991
	Herring Pond: Eastham	Yes	1991		
	Red Lily Pond: Barnstable	Yes	1987	Wastewater and Drainage Disposal Analysis	1989
	Shallow Pond: Barnstable	Yes	1991		
	Sheep Pond: Brewster	Yes	1993		

SHORT AND LONG-TERM GOALS

The following table contains the Departments Nonpoint Source Program's short and long-term goals for enhanced water quality throughout the Commonwealth.

WATER RESOURCE	SHORT TERM GOAL ON OR BEFORE 2005	LONG-TERM GOAL ON OR BEFORE 2015	STRATEGY/ACTION
LAKES - GENERAL	50% or 15,300 acres of 303(d) listed lakes will be enhanced, and thus delisted from the 303(d) list	100% or 30,600 acres of 303(d) listed lakes will be enhanced, and thus delisted from the 303(d) list.	Implementation of TMDLS for 303(d) lakes in accordance with the TMDL Strategy Schedule.
LAKES - SPECIFIC	Hall's Pond, Brookline, restoration: one (1) acre will be enhanced to allow for non-contact recreation		Implementation of 319 Restoration Project 97-08.
	Onota Lake, Pittsfield, restoration: 617 acres will be enhanced which will improve the trophic state from eutrophic to mesotrophic.		Implementation of 319 Restoration Project 97-08.
	Lake Noquochoke, Dartmouth, enhancement of 167 acres to to allow swimming and boating.		Implementation of SRF Clean Water Investment Project No. 207 (1998). construction of sewer around lake to eliminate failing Title 5 Systems.
	Cedar Pond, Sturbridge, restoration: 138 acres will be enhanced which will improve the trophic state from eutrophic to mesotrophic.		Implementation of SRF Clean Water Investment Project No. 125 (1998). construction of pressure sewers around pond to eliminate failing Title 5 Systems.
RIVER – GENERAL	10% or 117.6 miles of 303(d) listed rivers and streams will meet water quality standards.	100% or 1,176 miles of 303(d) listed rivers and streams will meet water quality standards.	Implementation of TMDLS for 303(d) rivers and streams in accordance with the TMDL Strategy Schedule.
RIVER - SPECIFIC	Mill Brook, Concord, restoration: approximately one (1) mile will be enhanced to restore its native fish population.		Implementation of 319 Restoration Project No. 98-04.
	Connecticut River, from Turners Falls to the VT/NH border: 1,000 feet of shoreline will be stabilized to upgrade fisheries, habitat and riparian habitat used by migratory birds.		Implementation of 319 Restoration Project No. 00-04.
	Lower Charles River will be fishable and swimmable.	Charles River: 62 miles will be enhanced to the point of meeting water quality standards.	Implementation of SRF Clean Water Investment Projects (Continued next page)

RIVER – SPECIFIC - STRATEGY/ACTION (Continued)

Project ID: 323
LGU: Needham
Project Name: NPS Pollution Study

Comment: The town of Needham will develop a plan for the management and maintenance of the municipal drainage system to improve the quality of stormwater discharges to the Charles River and its tributaries. Tasks include mapping and evaluation of the existing system, prioritization of deficiencies, development and evaluation of structural and non-structural alternatives for improvements, and preparation of a capital improvement program. The capital improvement program will include a detailed implementation plan for the prioritized list of recommended improvements.

Project ID: 157
LGU: Dedham
Project Name: Stormwater Management Planning

Comment: The town of Dedham will conduct comprehensive stormwater management planning in order to develop a program which will effectively prohibit dry weather discharges from the storm sewer system and reduce pollutant loadings from wet weather discharges to the maximum extent practicable. The planning project will include mapping and inventory of the storm-drain system, assessment and inspection to identify any sources of contaminated flows to the Charles or Neponset Rivers or their tributaries, and development of recommendations for both structural and non-structural control.

Project ID: 394
LGU: Newton
Project Name: Laundry Brook Dry Weather Investigation

Comment: This project will identify and eliminate point as well as nonpoint sources of sanitary wastes to Laundry Brook which drains directly into the Charles River. These objectives will be achieved through the implementation of a thorough inspection program.

Project ID: 319
LGU: Boston
Project Name: Gardner Street Landfill Closure Phase II

Comment: This project includes completion of the capping of the remaining uncapped area of the landfill to mitigate impacts to groundwater and surface waters by minimizing the generation and migration of leachate. The landfill borders the Charles River and Sawnmill Brook, land groundwater patterns are such that all groundwater beneath the landfill ultimately discharges to the Charles River.

Project ID: 128
LGU: Cambridge
Project Name: Common MH and Illicit Connections Removal

Comment: The goal of this project is the elimination of illicit connections and the approximately 422 interconnections (common manholes and common lamp holes) between the sanitary sewerage system and the storm drain system. In addition to the benefits to the water quality of the Charles River and Alewife Brook, the successful completion of this project will substantially reduce the volume of wet weather flow discharged to the MWRA's Deer Island Wastewater Treatment Plant.

Project ID: 387
LGU: CRPCD
Project Name: WWTP Improvements

Comment: The treatment plant will be upgraded with modifications to handle a design flow of 5.7 MGD.

Project ID: 361
LGU: MWRA
Project Name: Framingham Extension

Comment: The Framingham Extension Sewer has inadequate capacity to serve current and projected demand, resulting in surcharging and discharging of sewerage into local water bodies such as the Charles River and Beaverdam Brook. This project includes the installation of 25,000 lf. force main, construction of 21 mgd pump station, construction of 11,000 lf. of gravity sewer and rehabilitation of 23,000 if. of existing sewer.

WATER RESOURCE	SHORT TERM GOAL ON OR BEFORE 2005	LONG-TERM GOAL ON OR BEFORE 2015	STRATEGY/ACTION
COASTAL - GENERAL	10% or 16.9 square miles of 303(d) listed coastal waters will be enhanced to allow the re-opening of previously closed shellfish beds.	100% or 169 Square miles of 303(d) listed coastal waters will be enhanced to allow the re-opening of previously closed shellfish beds.	Implementation of TMDLS for 303(d) coastal waters in accordance with the TMDL Strategy Schedule.
COASTAL - SPECIFIC	Three Bay Area, Barnstable, restoration: one-half (½) square mile will be enhanced to re-open closed shellfish beds and upgrade two herring runs.		Implementation of 319 Restoration Project 97-09.
	Little Harbor, Cohasset, restoration: 0.29 square mile will be enhanced.		Implementation of TMDL.
		Boston Harbor (includes Boston Inner Harbor, Dorchester Bay, Quincy Bay, Hingham Bay, Hingham Harbor, Hull Bay and Winthrop Bay): 47 square miles will be enhanced.	Implementation of SRF Clean Water Investment Projects: (Continued next page)

COASTAL – SPECIFIC - STRATEGY/ACTION (Continued)

Project ID: 358
LGU: MWRA
Project Name: CSO

Comment: The CSO control plan is composed of 25 projects, including a variety of CSO control technologies. The plan will control discharges of CSO to Boston Harbor and its tributaries. The overall CSO control plan includes seven sewer separation projects, five projects for upgrading existing CSO treatment facilities, four CSO consolidation/storage conduits, two new CSO treatment facilities, two hydraulic relief projects, three pipeline relief projects, one outfall improvement project, and region wide controls for floatable materials at each CSO outfall.

Project ID: 379
LGU: MWRA
Project Name: Effluent Outfall Tunnel – Phase E

Comment: The outfall tunnel will discharge effluent from the Deer Island Plant east/northeast into Massachusetts Bay. This phase includes construction of a vertical access shaft at Deer Island and the effluent conduit, excavation of the outfall tunnel, lining of the tunnel with precast concrete panels, connection of the tunnel to vertical riser shafts, and transport of tunnel spoils to processing sites on Deer Island. The total length of the outfall tunnel, including the portion below the diffusers, is 9.5 miles. The effluent outfall conduit will carry the flow from the (should this be disinfected basins) disinfection basins to the outfall shaft.

Project ID: 104
LGU: MWRA
Project Name: Quincy Pump Facilities

Comment: The Quincy Pump Facilities were built between 1902 and 1942 and are beyond their service lives. The three pump stations, the Quincy Pump Station, the Squantum Station, and the Hough's Neck Pump Station and the Quincy and Squantum Force Mains are outdated, have numerous operational deficiencies, and insufficient hydraulic capacity to handle peak wet weather flows. This project includes replacement of the existing pump stations, and the rehabilitation of the force mains.

Project ID: 331
LGU: Boston
Project Name: Long Island Sewer Connection

Comment: This project will construct a pretreatment facility on the island and connect to the MWRA inter-island tunnel. The current WWTP has a history of discharge permit violations.

COASTAL – SPECIFIC (Continued)

WATER RESOURCE	SHORT TERM GOAL ON OR BEFORE 2005	LONG-TERM GOAL ON OR BEFORE 2015	STRATEGY/ACTION
Coastal-Specific (Continued)	Buzzards Bay: 1000 acres of shellfish beds reopened.		Implementation of the Buzzards Bay EPA approved workplan
	Winsegansett Marsh, Fairhaven. Salt-marsh restoration of 34 acres.		Implementation of 319 project and EPA's Five Star Grant project.
	Hammett's Cove, Marion. Salt-marsh restoration of 7 acres		Implementation of project plan funded by EOEA's Grow Wetlands Program.
	Sandy Neck Cove, Dartmouth. Salt-marsh restoration of 5 acres.		Implementation of salt-marsh restoration project funded by National Marine Fisheries Services.
	Buttermilk Bay and Little Buttermilk Bay, Bourne and Wareham. Upgrade of 540 acres of shellfish beds.		Implementation of Buttermilk Bay restoration project funded by the 319 Program, CZM's Coastal Pollution Remediation Program, and ISTEA.
	Eel Pond, Bourne. Re-open 15 acres of Shellfish beds.		Implementation of restoration project funded by CZM's Coastal Pollution Remediation Program.

SUBSECTION 3

Massachusetts Coastal Zone Management
Coastal Nonpoint Pollution Control Program

5 Year Implementation Plan
15 Year Program Strategy

DRAFT 02/00

Submitted by:
Massachusetts Coastal Zone Management
Massachusetts Department of Environmental Protection

TABLE OF CONTENTS

I. Urban Areas

A. Urban Areas: Stormwater Management

1. Long Term (15 Year) Goal:

By 2015, implementation of the Massachusetts Stormwater Policy and Management Standards through the Wetlands Protection and other Programs such as NPDES Phase II will reduce water quality impairments, remove waters from the state's 303d list, restore segments not supporting, and protect supporting beneficial uses such as shellfish beds and swimming beaches.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Increase compliance of stormwater policy implementation through continued technical assistance and education efforts.
- Specific targeted hands-on technical assistance to local officials, such as Conservation Commissions, through CZM, DEP, NRCS, MassBays, and Buzzards Bay Project technical and regional staff.
- Through DEP and local conservation commissions: ongoing compliance and enforcement of stormwater plans at project sites.
- Continued implementation of the DEP Circuit Rider Technical Assistance in each regional office. Dedicated staff in each region provide hands-on technical assistance to communities.
- Re-write of the Hydrology Guidance document for conservation commissions, local officials, and others.
- Contingent on funding, develop and implement a fifth round of stormwater workshops.
- Continued review and fine-tuning of the MA Stormwater Standards through the Stormwater Advisory Committee and Technical Committee.
- Develop and distribute informational and educational material as necessary, including a Stormwater Policy FAQ and a Technical Guidance Bulletin for Recharge of Stormwater.
- Targeted assessment work by DEP to identify existing municipal discharges not attaining state standards and issuance of non-compliance letters.
- Continued implementation of Coastal Pollutant Remediation Program, funding approximately $2 million on approximately 40 stormwater assessment and remediation projects in coastal watershed towns and municipalities.
- Development of an indicative project summaries informational document for the Coastal Pollutant Remediation Program which provides information (project description, constituent of concern and resource, remediation scheme/technology and any follow-up info) for past CPR projects. The goal of the document is to provide info (in the form of brief case studies) to municipal decision-makers regarding stormwater mitigation options.
- Contingent on funding, develop and implement pilot testing project for innovative stormwater treatment technologies, evaluating performance of 3 installations each of 4 technologies.
- NPDES Phase II assistance to affected municipalities: workshops, technical assistance, guidance material.
- Stormwater "daylighting" in the Charles and Neponset. Stormwater daylighting is a technique that uncovers stormwater conduits and exposing (or restoring) the channel as a more natural streambed.

B. Urban Areas: Onsite Disposal Systems (Title 5)

1. Long Term (15 Year) Goal:

By 2015, through continued implementation of the MA Title 5 code, impairments to surface waters and drinking water supplies will be reduced and all septic systems failing to meet Title 5 requirements will be upgraded at time of transfer or when specifically identified and assessed as causes of surface or ground water quality violations.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Continued technical assistance through specific training to local Boards of Health, soil evaluators, and system inspectors as proposed in DEP's Local CapacityBuilding Initiative Report (Jan. 2000)
- Continuation of the funding assistance programs: Homeowner Septic Loan Program, Comprehensive Community Septic Management Program, and the State Revolving Fund.
- Community wide facilities planning process: DEP to continue to evaluate and approve proposals for facilities planning that include an integrated approach to wastewater management, i.e. the use of on-site system upgrades coupled with conventional wastewater treatment facilities to address town-wide wastewater needs in an economical fashion.
- Education efforts for affected public and others, including Wastewater News and Waterlines.
- Expanded use of DEP web site to act as clearinghouse for publications and information.
- Issue comprehensive wastewater management guidance to municipalities and conduct training for same to correct major problems in most environmentally sound manner.
- DEP to evaluate and revise the Title 5 regulations, as appropriate, to improve the regulations as necessary.
- Continue to encourage the development of and approve innovative/alternative technologies for the onsite treatment and disposal of sewage
- MA Septic System Test Center will contribute to the reduction of coastal non-point contamination by onsite disposal systems in the following ways:
  - ✓ The Test Center will provide verification of contaminant (nutrient, organic load and pathogen) removals by alternative/innovative onsite disposal systems which can provide superior quality of effluent discharged to ground water.
  - ✓ The Test Center will provide verification of conventional (Title V) onsite disposal systems to serve as benchmark for comparison with I/A technologies and will provide needed data on levels of contaminant release to ground water by conventional systems.
  - ✓ The Test Center will provide a platform for research and development testing of new onsite disposal technologies, components and materials for technology vendors and DEP, which may improve both I/A and conventional performance. The Test Center will conduct outreach on I/A and conventional technologies to Boards of Health, health agents, system designers and the public in the form of facility tours and training workshops, through published reports on verified technology performance furnished to MA Boards of Health, through publication of testing results on the Test Facility webpage on the Buzzards Bay Project website and through print media articles.

C. Urban Areas: Erosion, Sedimentation, and Construction Site Control

1. Long Term (15 Year) Goal:

By 2015, through continued implementation of the Wetlands Protection Program performance standards, local site planning and project review through the Subdivision Control Act, and pro-active education on efforts such as conservation planning and sensitive development, the quantity of water resources assessed as non-supporting due to turbidity or suspended solids from site development sources will be substantially reduced.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Through DEP and local conservation commissions: ongoing compliance and enforcement of erosion control measures at project sites.
- Continued implemntation of the DEP Circuit Rider Technical Assistance in each regional office. Dedicated staff in each region provide hands-on technical assistance to communities.
- Development of state-endorsed model by-laws and regulations for local municipalities.
- Technical assistance to assist Massachusetts communities in the development, adoption, and implementation of these local by-laws and regulations through the Massachusetts' National Estuary Programs—the Buzzards Bay Project and the Massachusetts Bays Program—and other state efforts.
- Regional planning agencies in Massachusetts, such as the Cape Cod Commission, the Metropolitan Area Planning Council, the Merrimac Valley Planning Commission, and the Southeastern Regional Planning and Economic Development District, will also provide direct assistance to communities to support local level control of stormwater, erosion and sediment, and chemical controls.
- North Shore Regional Conservation Subdivision Pilot: MCZM to continue to work with an alliance of local officials, developers, engineers, realtors, conservation organizations, and state agencies to create and promote innovative sustainable development designs that protects land and water resources while maximizes the economic potential. The Alliance intends to begin bylaw distribution and outreach program in Spring 2000, focusing on the Parker River regional Area of Critical Environmental Concern communities in Phase One. Phase Two will include targeting communities outside the ACEC but having impact to that ecosystem.
- Middlesex Conservation District to continue to offer the program service to its 52 communities to review E&S plans for all soil disturbing projects over 5000 sq.ft. The district charges on an hourly basis so the program has built in sustainability.
- The current publication, Massachusetts Guidelines for Erosion & Sediment Control in Urban and Suburban Areas, will be scanned and posted on the Web in its entirety (including pictures).
- The fourteen Conservation District offices will continue to work closely with USDA - NRCS to develop and implement Conservation Plans on private lands - primarily agriculture.
- The Plymouth County Conservation District continues with its full time staff position for designing conservation plans on cranberry bogs. This program is focused on cranberry bogs because of the high demand and the very high workload. They expect the program to continue for at least another two years.

D. Urban Areas: Watershed Protection

1. Long Term (15 Year) Goal:

By 2015, Watershed Teams will have completed Comprehensive Watershed Assessments and 5-Year Watershed Action Plans identifying priority areas of NPS concern for further outreach, research, assessment, planning and implementation. Teams will work collaboratively with local stakeholders to identify sources of impairments due to non-point source pollution as well as strategies to address the impairment. Teams will implement priority projects resulting in water quality improvements and protection of sensitive habitat areas and resources.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Each year, 75% of the state's watersheds will have at least one priority project which addresses aspects of NPS pollution control;
- Watershed teams will provide technical assistance and guidance to watershed organizations and municipal boards regarding the implementation of the Phase II Stormwater rules;
- Watershed teams will work to assess sources of NPS contamination;
- Watershed teams will work to implement Agricultural BMP's;
- Watershed teams will work to identify meaningful 319 projects;
- Watershed teams will make recommendations for the protection and preservation of lands that have sensitive habitat or resource areas from NPS pollution;
- Watershed teams will work with towns to adopt conservation zoning bylaws or environmentally prudent zoning to protect natural resources from NPS pollution;
- Watershed teams will implement rapid watershed planning tools and techniques to assess small subwatersheds, using impervious cover as the indicator for stream quality;
- Watershed teams will engage watershed organizations and municipalities in NPS pollution control through outreach and education efforts;
- Watershed teams will manage restoration projects involving stormwater treatment systems to remove sediment and other NPS pollutants;
- Watershed teams will engage local constituents and work to control NPS pollution by weighing in on NPDES permits and implementing TMDL's before, during, and after the public participation process;
- The Watershed Initiative supports the efforts of watershed organizations and other groups by offering various funding opportunities, such as watershed stewardship service contracts to make environmental improvements; volunteer monitoring grants for volunteer groups to collect water quality data, and Communities Connected by Water service contracts for watershed organizations to work with municipalities to integrate growth planning with environmental protection.

E. Urban Areas: Roads and Highways

1. Long Term (15 Year) Goal:

By 2015, all new state and local roads, highways, bridges, and facilities will be in full compliance with the Stormwater Policy and Management Standards where practicable. Existing roads, highways, bridges, and facilities will incorporate adequate NPS Best Management Practices when reconstruction, widening or drainage work is planned OR such BMPs will be programmed when water quality assessments demonstrate violations of standards.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- A minimum of four regional workshops will be held on the new MHD policy/"meeting-the-stormwater-standards" document (MHDVolume 1).
- MHD will finalize the road and highway engineering and BMP specifications document (MHD Volume 2).
- A minimum of four regional workshops will be held on the MHD Volume 2 document
- State Highway Facilities will continue compliance through implementation of the MHD Environmental Management System.
- MHD and the Department of Transportation will implement NPDES Phase II requirements within established timeframes.

II. Marinas and Recreational Boating

A. Marinas and Recreational Boating: Marina Siting

1. Long Term (15 Year) Goal:

By 2015, all new marine facilities sited in Massachusetts receive planning and implementation assistance from the MCZM marina technical assistance staff prior to or during CZM federal consistency or MEPA review. As a result, new and expanded marinas are designed and sited in such a manner as to minimize impacts on water quality and aquatic resources.

2. Actions/Implementation Efforts (to 2005):

The following actions and benchmarks are anticipated:

- During pre-application technical assistance or permitting review, designs for new marinas incorporate pump-outs, improved fueling facilities, stormwater management, and hull maintenance facilities.
- Marina guidance document published and in the hands of all marine facility operators.
- Workshops held throughout Massachusetts' to publicize the document.
- MCZM marina technical assistance team is created and staff are educated and prepared to provide expertise in the siting, design, construction and operation of new marine facilities.
- Contingent on funding, a small-grants program developed to fund pollution prevention technologies at new and existing public and private marine facilities.

B. Marinas and Recreational Boating: Marina Operation

1. Long Term (15 Year) Goal:

By 2015, implementation of the Massachusetts Clean Marina Program, and state regulatory programs (CZM federal consistency, Stormwater Policy and Management Standards, MEPA, and Chapter 91) will reduce water quality impairments, remove waters from the state's 303d list, restore segments not supporting, and protect supporting beneficial uses such as shellfish beds and swimming beaches.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- MCZM marina technical assistance team is created and staff are educated and prepared to provide expertise in the siting, design, construction and operation of new marine facilities.
- Marina guidance document published and in the hands of all marine facility operators.
- As part of the guidance document, boater education brochures will be developed and distributed to inform the boating public of issues concerning recreational boat use and water and aquatic habitat degradation. Brochures will contain recommendations and steps to prevent and minimize such impacts.
- Five workshops will be held in Fall 2000 in five regions throughout Massachusetts' to publicize the release of the document and provide specific technical assistance and education.
- Contingent on available funding, a second and third phase of workshops will be run in 2001 and 2003.
- Contingent on available funding, a small-grants program will be developed to fund BMPs and other environmental improvements for new and existing marine facilities. This program will likely provide small grants, cost-share or no/low interest loans for: vacuum sanders for hull maintenance; hull washing facilities; purchase, operation and

maintenance of pump-out facilities; public and boater education; fueling station retrofitting and maintenance; and solid, liquid, recyclable and hazardous waste management.

- Contingent on available funding, a Clean Marina Program will be piloted and evaluated to encourage marinas to develop and implement marina management plans. Participants in the program receive publicity from the state, a flag to fly over their facility and are free to use a Clean Marina logo in any advertisements and correspondence. Program is developed as a positive approach, which recognizes the efforts of marinas to protect the resources that provide their livelihood.
- Contingent on available funding, a pilot technical assistance and inspection program will be developed, implemented and evaluated. In a specific region, all marina operations will be visited and reviewed for implementation of good housekeeping and BMPs. Technical advice and steps to implement BMPs will be delivered. Through the coordination of annual marina operator's license with DEP Chapter 91 program, follow-up visits will determine efforts to meet inspection recommendations and compliance.

C. Marinas and Recreational Boating: Pump-Out Facilities

1. Long Term (15 Year) Goal:

By 2015, state waters of Massachusetts will be an approved No-Discharge Area. Pump-out facilities will be installed so that one facility exists for every 450 boats with marine sanitary devices.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Contingent on continued CVA funding, a grants program will continue to fund purchase, operation and maintenance of pump-out facilities at private new and existing marine facilities. Increased emphasis will be given to supporting operation and maintenance for existing facilities.
- With the efforts for statewide NDA designation, increased efforts will be given to enforcement by local harbormasters and state environmental police.
- Marina guidance document published and in the hands of all marine facility operators.
- As part of the guidance document, boater education brochures will be developed and distributed to inform the boating public of the need, requirement, and availability of pump-out facilities.
- This brochure and others will be distributed to all Massachusetts' boaters with their registrations.

D. Marinas and Recreational Boating: Recreational Boating and Public Education

1. Long Term (15 Year) Goal:

By 2015, education efforts aimed at recreational boaters will be fully developed, in-place and effective. Improvements in recreational boating best management practices will result in advances in the number of vessels equipped with pump-out ready holding tanks (marine sanitary devices), the practices of do-it-yourself hull cleaning and maintenance, and the number of marine stores selling environmentally friendly products.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Marina guidance document published and will be made available to recreational boaters who are do-it-yourself maintenance and repairs types through the CZM website and through hard copies distributed through CZM regional offices.
- As part of the guidance document, boater education brochures will be developed and distributed to inform the boating public of the need, requirement, and availability of pump-out facilities.
- This brochure and others will be distributed to all Massachusetts' boaters with their registrations.
- Educational signage provided to marine facilities.
- Contingent on funding, workshops targeted towards recreational boaters and boating groups will be organized and held to educate boaters about environmental concerns.
- MCZM participates and organizes activities for the National Clean Boating Campaign.

III. Agriculture

Goals (2000-2005)

By 2005, all farms known to cause impairment of water resources to levels violative of established water quality standards will have developed of Conservation Farm Plans, or the equivalent, and will have implemented 70% or greater of the Best Management Practices outlined in the respective plans.

By 2005 all Animal Feeding Operations (AFOs - farms with over 300 animal units) will have completed Conservation Farm Plans, or the equivalent.

Goals (2006-2010)

By 2010, all AFOs will have implemented 70% or greater of the Best Management Practices outlined in their respective Conservation Farm plans, or equivalent.

By 2010, the Department of Food and Agriculture will attempt to have identified those farms believed to pose significant threat to water resources. All identified as such will be strongly encouraged to develop Conservation Farm Plans, or the equivalent.

By 2010, the majority of all farms in Massachusetts will have voluntarily developed Conservation Farm Plans, or the equivalent. These plans will be designed so as to prevent pollution from the farm from causing water quality to fall below established water quality standards.

Goals (2011-2015)
By 2015 the Department of Food and Agriculture will attempt to ensure that 70% of the Best Management Practices described in respective Conservation Farm Plans, or the equivalent, have been implemented by farms believed to pose a significant threat to water resources.

A. Agriculture: Farm Planning

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- MA DEP and MA DFA will evaluate all known farms near water resources. Where there is evidence that activities on the farm may pose risks to water resources, this farm will be targeted to develop conservation plans either through the USDA- Natural Resources Conservation Service Farm Planning process, or other planning tool such as the "On Farm Strategies To Protect Water Quality" workbook.
- Through a variety of mechanisms, farmers will be contacted and encouraged to develop Conservation Farm Plans, or the equivalent. Technical and financial assistance options will be available to help implement BMP elements of the plans. The agencies and organizations assisting in this statewide effort include will include: UMASS, MA DFA, MDC, USDA-NRCS, USDA-FSA, EOEA-Watershed Initiative and agricultural organizations.
- Evaluation measures to determine success include:
  - ✓ Distribution of the Agricultural Environmental Enhancement (AEEP) and Environmental Quality Incentives Program (EQUIP) funds, and targetted fund from other agencies such as DEP and MDC.
  - ✓ Location and extent of implementation of best management practices or conservation plans,
  - ✓ Extent of cooperation between agencies to reach farmers and install best management practices in a timely manner to reach water quality standards,
  - ✓ Monitoring the Basin Team water quality assessment results and correlating inconsistencies attributable to agriculture,

- ✓ Creation of a geographic information system data layer to show locations of farms implementing best management practices using state funding.

- NRCS will continue to provide direct conservation planning assistance through the Conservation Technical Assistance Program (CTA) and the Environmental Quality Incentives Program (EQIP). Other NRCS programs such as Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP) and the Wildlife Habitats Incentives Program (WHIP) will also be utilized where feasible.

B. Agriculture: Nutrient Management and Animal Feeding Operations

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- UMASS Cooperative Extension will develop 15 nutrient management plans over a three-year period for dairy farms with proximity to receiving waters.
- Pending adequate funding, 10 Nutrient management workshops will be held statewide during 2000 and 20001 to demonstrate to farmers how to develop nutrient management plans.
- NRCS will develop a certification program for engineers, agronomists and other qualified individuals to develop nutrient management plans by 2001.
- DFA, DEP and EPA will work cooperatively on an inspection/compliance program beginning in FY 2000.
- DFA will inspect all AFOs over 300 animal units for potential water quality impacts by 2001.
- DEP/EPA and DFA will work to assist farmers with significant, documented environmental problems with financial and technical assistance to remedy the problem. If the problem cannot be resolved in a reasonable period, then an individual NPDES permit will be issued.
- NRCS will to continue to provide direct conservation planning assistance through the Conservation Technical Assistance Program (CTA) and the Environmental Quality Incentives Program (EQIP).

C. Agriculture: Grazing, Erosion & Sediment Control

1. **Actions/Implementation Efforts (to 2005):**

The following benchmarks and actions are anticipated:

- Potential water quality problems related to grazing, erosion and sediment runoff will be assessed and investigated by MA DFA, MA DEP and Watershed Initiative.
- Where problems are found, MA DFA, NRCS and UMASS will respond and offer educational, technical and financial assistance, as needed and available, to implement best management practices such as the implementation of grazing management plans, fencing, buffers, cover crops and other erosion control measures. Monitoring of this goal will be through the Watershed Initiative, NRCS, DEP and DFA as part of the normal monitoring and evaluation phase of their programs.
- NRCS to continue to provide direct conservation planning assistance through the Conservation Technical Assistance Program (CTA) and the Environmental Quality Incentives Program (EQIP).

D. Agriculture: Irrigation

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- DFA will encourage cranberry producers to implement approved water management plans. It is expected that the majority of this group of producers will have fully implemented the recommended best management practices.
- DFA will encourage other producers, on whose farms irrigation, erosion and sediment transport issues have been identified, to implement relative Best Management Practices. Trickle irrigation projects, and other BMP costs related to irrigation and water management, will be considered for cost share funding by both NRCS and DFA.
- DFA, UMASS and the Cranberry Institute will work to develop best management practices for the use and handling of pesticides and fertilizers introduced into chemigation systems.
- Monitoring of these goals will be conducted through the Watershed Initiative, NRCS and DFA as part of the normal monitoring and evaluation phase of their programs.

E. Agriculture: Pesticide Control Program

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- The Pesticide Bureau has the authority and resources to enforce all federal and state pesticide use laws. Monitoring and evaluation of the appropriate application use of pesticides will continue through DFA's enforcement and compliance assistance efforts.
- Pending adequate funding, six pesticide container collection & recycling events will be held statewide to address water quality concerns associated with the disposals of pesticide containers. These programs will be targeted towards, and made available to all commercial users of pesticides including but not limited to agriculture, landscaping, structural pest control operators and lawncare operators.
- Pending adequate funding, six waste pesticide disposal pesticide container collection events will be held statewide to address water quality concerns associated with the disposal of waste pesticides. These programs will be targeted towards, and made available to all commercial users of pesticides including but not limited to agriculture, landscaping, structural pest control operators and lawncare operators
- NRCS, UMASS and DFA will offer technical and financial assistance to farmers seeking to improve systems for mixing, loading and storage of pesticides
- Workshops and other educational mechanisms will be offered to inform commercial pesticide applicators of Best Management Practices and water quality initiatives on the state and federal level. Offering pesticide recertification credits which applicators must obtain in order to remain licensed will encourage attendance.
- NRCS to continue to provide direct conservation planning assistance through the Conservation Technical Assistance Program (CTA) and the Environmental Quality Incentives Program (EQIP).

F. Agriculture: Assistance Grants

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- NRCS will continue to administer the Environmental Quality Incentives Program (EQIP) which offers direct cost-share assistance to producers to install conservation management systems (approx. $500,000 each year).
- Through 2003, DFA's Agricultural Environmental Enhancement Program (AEEP) will offer grants to farmers to install BMPs on farms ($200,000 annually for 3 years as provided for in Rivers Protection Act). Pending adequate funding, DFA will attempt to increase annual amounts and extend the grant program beyond 2003.
- Contingent on funding, DFA will attempt to expand the Agricultural Environmental Enhancement Program beyond 2003.
- DFA, USDA-NRCS and USDA-FSA will continue to explore mechanisms to increase utilization in Massachusetts of USDA's Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP) and the Wildlife Habitat Incentives Program (WHIP).
- DFA, in conjunction with UMASS Extension, USDA Agencies, and other organizations will attempt to secure additional funding to assist farmers with the development and implementation of nutrient management plans.

IV. Forestry

A. Forestry: Forest Cutting Practices

1. Long Term (15 Year) Goal:

By 2015, through continued implementation of the Forest Cutting Practices Act and its coordination with the Wetlands Protection Program performance standards, and pro-active education on efforts such as forestry BMPs, less than 5 % of water resources will be assessed as non-supporting and no wetland enforcement orders will be issued due to forestry operations.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- DEM to continue to offer programmatic technical assistance and outreach efforts to the forest cutting community. Since 1984, DEM reviews an annual average of 763 forest cutting plans, making comments, revisions, and modifications as necessary. DEM service foresters make routine site and operation checks.
- DEM to conduct another workshop series on the MGL c.132 regulations with emphasis on forestry BMPs across the state each spring in cooperation with staff from other state agencies, UMASS extension, Forest Products Marketing and Development Center at Mt. Wachusett Community College, forestry consultants and loggers. A workshop will be held in each service forester district (14 in number) in a twilight format in order to make it more convenient for people to fit it in with their normal work schedule. This workshop provides 3 continuing education credits toward the 9 hours that are required over a 3-year period for timber harvester licensing.
- The web site for DEM will be updated to improve the quality of information on a continuing basis and will include information on forestry regulations, program information and availability of technical assistance.
- DEM to issue publication entitled Forest Resources in Massachusetts containing an A-Z description of the Massachusetts forest resource in spring 2000.
- DEM to start development of a 5-year Strategic State Forest Resource Plan in mid 2000. This plan will identify many forest resource issues including NPS.
- DEM plans to develop a BMP effectiveness monitoring procedure in order report statistically on the various BMPs used. DEM will look at all the cutting plans (operations) from beginning to end with final sign-of and compile a statistical report to evaluate the effectiveness of specific BMPs. DEM is working with the U.S Forest Service on this project and will seek funding sources (319 grant) to run a pilot.
- DEM to use existing video footage to develop a training video on forestry BMPs. By 2001, the video project should be complete. EOEA funds will be sought.
- DEM will reprint the forestry BMP manual (third reprint).
- In 2001 or 2002, DEM will initiate rewrite the BMP manual to incorporate new or refined forestry BMPs.
- MDC to continue to provide 100% funding for writing 10-year Forest Stewardship and Chapter 61 plans on privately held watershed properties, to improve the likelihood these properties will remain forested, and will be properly managed. 3,036 acres have been incorporated to date.
- MDC to promote voluntary replacement of petroleum-based logging equipment fluids (e.g. bar and chain oil) with vegetable-oil (canola) based substitutes. MDC requires that all timber harvesting machinery be equipped with a minimum square footage of petroleum-absorbing "spill cloth", to limit pollution associated with machine failures.
- MDC to enforce through harvesting contracts the listing of all common timber harvesting equipment and the ground pressure and total widths associated with this equipment, based on specific tire sizes and overall machine weight (wide tires produce lower ground pressure but increase machine width). This chart is used to synchronize logging equipment with site sensitivity (e.g. ground pressure limits based on the ability of soils to support equipment, and width limits to reduce residual tree damage in tight stands).

- MDC to continue to implement enhanced road building and maintenance practices for all timber access roads in order to reduce the erosion of sediments from these unvegetated surfaces. Practices include the use of retention and detention basins, geotextiles, silt fences, haybales, seeding, and water release contouring.
- MDC to continue to review proposed timber harvesting areas in order to reduce the impacts of that harvesting on the identified and mapped vernal pools (more than 400), rare and unusual habitats (about 30), and rare plant populations, and inventory of all historic and potential prehistoric cultural sites of significance.
- MDC to continue to operate forestry activities on the Quabbin watershed as "Green Certified". MDC's Quabbin operations were the first public property to receive this designation after an intensive review by the SmartWood certifying branch of the National Wildlife Federation.
- UMass Extension Service to provide coordinated support and assistance on the revision and rewrite of the state forestry BMP manual.
- UMass Extension Service to continue to provide hands-on technical assistance and education as requested and needed.

V. Hydromodification

A. Hydromodification: Channelization and Channel Modification Wetlands Protection Program, Chapter 91 Program, MCZM Dredging Program

1. Long Term (15 Year) Goal:

Continue to implement the Wetland Protection Program performance standards, Chapter 91 permits and licensing, and 401 Water Quality Certification to prevent or minimize impacts from channelization, stream and coastal bank hardening, and channel dredging. Maximize opportunities for restoration of coastal and riparian habitat.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Regulatory committee to revise Dredged Material Management regulations (310 CMR 9.00)
- Development of comprehensive Dredged Material Management Guidance document and innovative web site.
- Early resource identification and location through interactive GIS-based marine Resource Characterization tools.
- Continue joint-processing (federal and state agencies) pre-application meetings and guidance for all channel and dredging modification project.
- Federal and state agency personnel technical coordination and education meetings.
- Public meetings and outreach efforts for state Designated Port Areas.
- Contingent on funding, another round of Riverfront Protection Act workshops will be developed and implemented.

B. Hydromodification: Erosion & Sediment Control from Dams Dam Safety Program

1. Long Term (15 Year) Goal:

Continue to implement the Dam Safety Program's erosion control provisions for slopes, embankments, and crests of existing and new dams to prevent these structures from becoming sources of NPS pollution.

2. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Continue implementation of state MGL c. 253 licensing provisions and protocols. All projects (new, reconstruction, or repair) require strict erosion and sedimentation controls.
- In-water siltation controls are also mandatory requirements for all projects (new, reconstruction, or repair).
- DEM Dam Safety staff inspect existing dams according to the schedule below depending on their status or if a complaint or concern has been registered, staff inspect immediately:
  - ✓ High hazard: every 2 years
  - ✓ Medium hazard: every 5 years
  - ✓ Low hazard: every 10 years

VI. Wetland Restoration and Assessment

A. Wetland Restoration and Assessment: Wetland Restoration Efforts

1. Long Term (15 Year) Goal:

By 2010, restore 3,000 acres of Massachusetts's inland and coastal wetlands. By 2015, restore 5,000 acres of Massachusetts's wetlands.

1. Actions/Implementation Efforts (to 2005):

The following benchmarks and actions are anticipated:

- Complete 10 watershed wetlands restoration plans identifying priority restoration sites in 10 watersheds.
- Complete inventories of the entire Massachusetts coastline to identify tidally restricted salt marshes.
- Continue to work with Massachusetts Audubon Society, Coastal Zone Management, ACEC Program, and other partners to develop a restoration plan and to promote restoration of salt marshes in the Great Marsh.
- Continue to identify and support wetland restoration projects under the GROWetlands (Groups Restoring Our Wetlands) Initiative. Under this program, WRBP provides technical, fundraising, and other support to local and other project sponsors.
- Maintain an active working relationship with our Coastal America partners under the "Resolution to Restore Massachusetts Wetlands" (a Coastal America agreement signed in 1994). Engage federal agencies as partners on specific projects as appropriate.
- Continue to manage the Massachusetts Corporate Wetlands Restoration Partnership, which brings corporate cash and in-kind services support to wetland restoration projects.
- Continue to establish protocols for project monitoring and report results of both projects and the program overall.
- In order to increase understanding of restoration project results and the functions of restored wetlands and to improve restoration techniques, we will build working relationships with academic institutions to establish research projects at selected wetland restoration sites.
- Continue to build a strong education and outreach program to ensure broad public understanding of and support for wetland restoration.

B. Wetland Restoration and Assessment: Wetland Assessment

1. Long Term (15 Year) Goal:

By 2015, ecological assessment methodologies for salt marsh wetlands and freshwater herbaceous and shrub marshes will be fully developed and utilized by state planning groups, regional non-profits and volunteers, and local officials as an effective tool for identifying wetland sites requiring remediation/restoration, evaluating the success of restoration projects, inventorying subwatersheds or land holdings, and for piloting wetlands biocriteria.

2. Actions/Implementation Efforts (to 2005)

The following benchmarks and actions are anticipated:

- Continue work on EPA Region I Pilot: Cape Cod Bay Salt Marsh Assessment Project to refine methodologies for salt marshes degraded by proximate land use and tidal restrictions. Indicators include aquatic macro-invertebrates, vegetation, avifauna, fish, pore and surface water chemistry, and hydrology.
- Develop and test indicator protocol for fish or nekton for addition as a viable and effective component of the salt marsh assessment toolbox.
- Continue to engage volunteers in the use and application of the wetland assessment methodologies.
- Through the North Shore Volunteer Wetland Health Project continue to refine the volunteer training modules and handbook.
- Represent MCZM on EPA=s New England Biological Assessment of Wetlands Workgroup.
- Present papers and give presentations as necessary/requested
- Explore and engage in new opportunities for the utilization of the wetland assessment methodologies.

VII. MAJOR ACCOMPLISHMENTS SINCE THE ORIGINAL NONPOINT SOURCE MANAGEMENT PLAN (1989)

There have been many major accomplishments in the nonpoint source sphere since the development and approval of the original Management Plan. Most all of these are described in this plan but it would seem appropriate to list and briefly describe them here for easy reference. The term "major" is used here to denote a significant new law, regulation, program or policy which is expected to have a lasting impact on the prevention and control of nonpoint source pollution. The accomplishments are listed in no particular order which may reflect on their relative importance.

A. Creation and Implementation of the Watershed Initiative

The creation of the Watershed Initiative is a deliberate and formal recognition by EOEA of the importance of managing the state's water resources on a watershed basis. The inclusion of the NPS Program within the Watershed Initiative gives the program greater visibility and an integral role in the watershed approach to controlling and preventing water pollution.

B. Development of a Coastal Nonpoint Pollution Control Plan

The development and implementation of this plan will be a major stimulus to the state's NPS Program. The integration of the Coastal Plan into the 319 Management Plan and its application state-wide is considered significant. The inclusion, adoption and implementation of enforcement provisions contained in the Coastal Plan will lend the NPS Program greater credence and ensure greater success with the implementation of the 319 Management plan.

C. Title 5 Revisions

The 1994 revisions to the regulations governing the subsurface disposal of sanitary sewage will have a major and positive long lasting impact on nonpoint source pollution to groundwater.

D. Watershed Protection Act of 1992

The primary goal of the Act is to improve watershed protection around the Metropolitan Boston reservoir system. (A detailed description of this Act was presented in the 1994 update of the NPS Management Plan).

This Act will have far-reaching impacts on watershed protection of water supplies on a state-wide basis.

E. Phosphorus Control Act

In July of 1993 "An Act Relative to Environmental Protection By Ensuring A Safe Water Supply For Drinking And Other Purposes" was signed into law. This law prohibits the sale of household cleansing products which contain phosphorus concentrations in excess of trace amounts in Massachusetts after July 1, 1994. The Act also limits the phosphorus content of certain commercial cleansing products to 8.7 percent by weight expressed as elemental phosphorus. This legislation will have a significant and long-lasting impact on controlling eutrophication of the waters of the Commonwealth through the reduction of phosphorus from septic system and wastewater treatment plant effluents.

F. Forestry GEIR

This major document and the resultant actions resulting therefrom are expected to yield major benefits from the further control of nonpoint sources from silvicultural activities state-wide.

G. Road Deicing GEIR

This major document is expected to result in greater protection of water supplies from the impact of road deicing chemicals. The Highway Department recommends the implementation of BMP's within well-head protection zones to protect water supplies.

H. Cape Cod Commission

The creation of this Commission with authority to control certain major developments on Cape Cod for the purpose of protecting the ground and surface waters from nonpoint sources of pollution is a significant achievement.

I. The Bay Programs

The approval of the Buzzards Bay Program and Massachusetts Bays Program is and will continue to have long-lasting beneficial impacts from the control of nonpoint source pollution in their respective watersheds. These are major programs which have specific implementation strategies to address NPS pollution and the protection of the natural resources in their areas.

J. Mega Manual

The development, publication and distribution of this municipal nonpoint source management manual was a major accomplishment. It has been sent to every municipality in the state for the purpose of assisting local authorities to understand nonpoint source pollution and help them implement measures to control and prevent it at the local level. Coupled with an aggressive outreach program this manual should have a long-lasting impact on protecting the water resources of the state.

K. Stormwater Management Manual

This manual, a companion to the Mega Manual, sets force minimum performance standards and detailed design criteria for stormwater best management practices. This manual is expected to have widespread application by municipal and state authorities in the control and prevention of nonpoint source pollution from stormwater.

L River Protection Act – 1996

This Act affords a far greater degree of protection to the state's rivers and streams by doubling the protective zone from 100 to 200 feet.

VIII. FUNDING SOURCES

The original Nonpoint Source Management Plan identified several funding sources potentially available to implement the various short and long-term strategies presented in the plan. For each specific strategy a particular funding source was identified and, where appropriate, the necessary funding level was indicated. A different approach will be used in this updated edition of the Management plan to better reflect the limited availability of funding sources and the intense competition for their use. The approach will be to identify a funding source, describe its intended use and then describe how it may be used to implement portions of the updated Management Plan.

The situation regarding nonpoint source funding may improve in the near future with the anticipated reauthorization of the Clean Water Act. Certain draft versions of the reauthorization bill have expanded the Section 319 Nonpoint Source Program and increased the authorized level of funding. There is also the new Coastal Nonpoint Source Plan (Section 6217 of CZRA of 1990) which may affect nonpoint source funding levels. The discussion on funding sources that follows has been developed with some forethought of these occurrences.

1. SECTION 319 FUNDS

A. INTENDED USE

These funds are appropriated annually by Congress pursuant to Section 319 of the Clean Water Act, the National Nonpoint Source Program. They are to be used to implement a state's Nonpoint Source Management Plan and require a forty percent nonfederal match.

The state must develop an annual workplan which is then integrated into the Performance Partnership Agreement (PPA) which is a workplan and list of deliverables with EPA. EPA has issued detailed guidance (Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years)on the 319 program, annual workplan and use of funds. The level of funding for Massachusetts from 319 funds has generally been about one million dollars..

B. PROPOSED USE

The current and projected use of 319 funds will be to implement and administer the core Nonpoint Source Program outlined in Volume II of the updated Management Plan. As described in Volume I, the core Nonpoint Source Program is an integral part of the Division of Watershed Management which is committed to a basin by basin approach to managing the state's water resources. The use of any 319 funds is governed by an annual workplan approved by the EPA within the PPA.

A caveat is entered here regarding the future use of 319 funds as it relates to the Coastal Nonpoint Pollution Plan. As described earlier in this plan, the Coastal Nonpoint Pollution Plan is under provisional approval and when completed and given final approval by EPA and NOAA it will be appended to and incorporated into this Management Plan. It is likely that 319 funds will be used to implement portions of the Coastal Plan. Such use, however, will be in context of the core Nonpoint Source Program and its basin by basin approach outlined in Volume II. Although any further detailed discussion would be only speculative at this time, it is anticipated that accommodation can be made for the Coastal Plan insofar as the goals and objectives of the Coastal Plan would by synonymous with this Management Plan.

2. STATE REVOLVING FUND

A. INTENDED USE

Under the 1987 amendments to the Clean Water Act there was created a new Title VI: State Water Pollution Control Revolving Funds. The purpose of the revolving fund is to replace Title II: the Construction Grants Program for wastewater treatment facilities. The revolving fund may provide assistance (1) for construction of treatment works... which are publicly owned, (2) for implementing a management program under Section 319, and (3) for developing and implementing a conservation and management plan under the National Estuaries Program. The state revolving fund is funded by capitalization grants from EPA and state matching funds.

In Massachusetts a state revolving fund was created under MGL Chapter 29C: Water Pollution Abatement Revolving Loan Program. Under this program a trust fund is established and maintained to grant loans to public entities to conduct water pollution abatement projects. Chapter 29C defines "water pollution abatement project" to include "... any eligible facilities for implementation of a nonpoint source pollution control management program... pursuant to the Clean Water Act". The state revolving fund therefore may be used to implement any portion of this updated Management Plan, including the Coastal Nonpoint Pollution Plan approved pursuant to Section 6217 of the CZRA of 1990.

B. PROPOSED USE

To date the Massachusetts revolving fund has not been used extensively for nonpoint source implementation projects. It is identified here, however, as a viable source of funding for several priority portions of this updated Management Plan.

1. Septic Systems (Title 5)

This Management Plan contains a long-term strategy to address substandard septic systems (cesspools or failing septic systems). During the lengthy process of revising the Title 5 regulations the issue of cost to the homeowner rose to the top. It is proposed here that the state revolving fund continue to be used on an expanded scale to make low interest or no interest loans to eligible homeowners to upgrade substandard septic systems. The Watershed Initiative could be used to help prioritize those watersheds in most need of help.

A program could be established on a municipal or regional basis to administer septic system upgrade loans to eligible applicants. The program could benefit from the experiences of California and/or Washington which are currently administering such septic system revolving loan programs. Priority may be given to those substandard septic systems which have been identified as contributing to or causing the closure of shellfish beds, recreational water resources or public water supplies.

2. Agricultural BMP's

This Management Plan contains a section on agricultural nonpoint source pollution. The Coastal Nonpoint Pollution Plan addendum further discusses this category and describes a strategy for addressing agricultural establishments which are known sources of continuing nonpoint source pollution. It is proposed here that the state revolving fund be used to make low interest or no interest loans to eligible farmers to implement agricultural BMP's to abate sources of nonpoint pollution.

A program could be established through the Conservation Districts with assistance from the Watershed Initiative to administer such loans to eligible farmers. Priority may be given to those agricultural activities which have been identified as sources of pollution to public water supplies, shellfish beds or recreational water resources. The program could benefit from the experiences of California, Washington or Wyoming which currently administer similar programs.

3. Stormwater Runoff BMP's

This Management Plant (including the appended Coastal Plan) contains a section on urban runoff causing nonpoint source pollution. There is reference to a Stormwater Management Manual which sets forth minimum performance standards and design criteria for stormwater runoff BMP's. Urban runoff has been identified as the lead category causing nonpoint source pollution in Massachusetts. It is proposed here that the state revolving fund be used on an expanded scale to make low interest loans to public entities to purchase property and/or construct stormwater BMP's to control or prevent nonpoint source pollution.

A program could be administered through DEP's Bureau of Municipal Assistance with assistance from the Watershed Initiative to provide loans to eligible public entities. Priority may be given to those projects which can be identified as causing or threatening to cause pollution of public water supplies, shellfish beds or recreational water resources. Eligible facilities may include the purchase of property for stormwater BMP's, the design and construction of stormwater BMP's, construction of wetlands for stormwater treatment and source prevention or reduction BMP's. The program could benefit from the experience of California which has an extensive urban runoff revolving loan program.

3. SECTION 104(B)(3) FUNDS

A. INTENDED USE

The Clean Water Act states, in pertinent part, under Section 104(b)(3) that EPA is authorized to "make grants to State water pollution control agencies... for the prevention, reduction, and elimination of pollution" through the promotion, conductance and acceleration of "...research, investigations, experiments, training, demonstrations, surveys and studies...". The EPA has determined that any grant administered under Section 104(b)(3) should focus on regional priorities implemented on a watershed approach. These priorities include TMDL development for priority watersheds, projects that support the Clean Water Strategy, projects that develop and implement effective pollution prevention practices and stormwater related issues. The EPA also encourages states to use 104(b)(3) funds in conjunction with or in support of other water pollution control programs, such as the Nonpoint Source Program, especially for those purposes which are not eligible for funding under the Section 319 program.

B. PROPOSED USE

It is proposed that 104(b)(3) funds be targeted to conduct activities of the Division of Watershed Management outlined in Volume I of the Management Plan update which are necessary prior to the implementation of nonpoint source controls in priority subwatersheds. Such activities may be focused on priority stormwater runoff issues. Water quality assessment, total maximum daily load (TMDL) and outreach activities within priority subwatersheds would be appropriate examples.

Another example which is currently funded under 104(b)(3) is the project titled "Implement Clean Water Strategy by Targeting Stormwater Controls and Wetland Impacts to Regain Use of Critical Aquatic Resources". The conceptual approach of this project includes:

* identifying the co-occurrence of previously filled or degraded wetlands and stormwater discharges.

* identifying critical regional wetland resource functions that are of high ecological and societal value.

* working with watershed communities to set basin goals for stormwater management through wetlands restoration.

* Identifying and prioritizing aquatic habitats to be restored as a component of DWM's basin-by-basin strategy.

Central to this project is the involvement of the impacted communities in order to ensure that local preventative and rehabilitative initiatives are used as part of a state/local comprehensive basin planning effort (i.e., outreach, technical transfer and training). At the local level, an aquatic system rehabilitation strategy will offer local officials a series of recommendations to restore stormwater impacted water resources that lead to long-term cost effective measures for pollution prevention. Such recommendations may be eligible for implementation, on a demonstration basis, through Section 319 funds allotted for water resource restoration projects.

Judicious use of 104(b)(3) funds to support appropriate nonpoint source assessment and study activities prior to any project implementation would result in higher quality projects and an increased chance of success. The holistic watershed approach is consistent with the 104(b)(3) program, NPS Program and Clean Water Strategy.

4. SECTION 604(B) FUNDS

A. INTENDED USE

The Clean Water Act provides that one percent, or $100,000, whichever is greater, of federal capitalization grants for a state's water pollution control revolving fund be used for water quality management planning activities described under Section 205(j) or 303(e) of the act. These activities include, but are not limited to, the following:

* identifying most cost effective and locally acceptable facility and nonpoint measures to meet and maintain water quality standards (205(j)(2)(A)).

* developing an implementation plan to obtain state and local financial and regulatory commitments to implement measures developed pursuant to the immediately above activity (205(j)(2)(B).

* determining the nature, extent and causes of water quality problems in various areas of the state and interstate region, and reporting on these annually (205(j)(2)(C).

* maintain a continuing planning process which includes total maximum daily load for pollutants and all elements of any applicable area-wide waste management plans under Section 208 and applicable basin plans under Section 209 (303(e)).

It should be noted that at least forty percent of any 604(b) funds must be allocated to comprehensive planning organizations (regional planning agencies or RPA's).

B. PROPOSED USE

The Bureau of Resource Protection (BRP) administers the 604(b) grants, including the 40% allocation to RPA's. A link should be established between the use of the 604(b) grants and implementation activities conducted under the 319 Nonpoint Source Program. This effort should be coordinated with the activities of the DWM and the basin-by-basin schedule. It is proposed that specific attention be focused on groundwater issues and public water supplies. The Comprehensive State Groundwater Protection Plan (CSGWPP) should describe and prioritize groundwater issues and indicate appropriate implementation strategies that may be funded through the 319 program. Any necessary diagnostic, assessment or study work that must precede project implementation should be supported through 604(b) funds.

Funds allocated to the RPA's should be coordinated with the DWM basin schedule thereby allowing the opportunity for timely implementation of projects under the 319 program.

It is suggested that the BRP Circuit Rider Program be utilized to provide the coordination effort between 604(b) funded activities and the nonpoint source program. It is understood that the Circuit Rider Program will follow the DWM basin schedule and thus may be the appropriate choice. This argument becomes further compelling with the understanding that the nonpoint source outreach program will be coordinated with the Circuit Rider Program.

5. INTERNODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991

A. INTENDED USE

The Internodal Surface Transportation Efficiency Act of 1991 (ISTEA) was intended by Congress to further develop a National Internodal Transportation System that is economically efficient and environmentally sound. The transportation system is intended to give special emphasis to social benefits, especially to reduced air pollution, reduce traffic congestion and environmental aspects of the quality of life in the United States. In practical terms, ISTEA authorizes appropriations to the states for the construction, reconstruction, maintenance and improvements to the interstate and state highway systems and other transportation projects. As an aside, the reader may be interested to know that ISTEA was the legislative vehicle that allocated funds to Massachusetts for the central artery and third harbor tunnel project in Boston.

As described in this Management Plan under the long-term strategy for stormwater runoff control relating to state, county and federal roadwork, ISTEA authorizes and apportions certain funds for nonpoint source abatement and prevention projects connected with eligible highway work.

B. PROPOSED USE

It is proposed that the Massachusetts Highway Department engage in a program to use properly allocated highway funds to implement stormwater runoff BMP's as intended and authorized by ISTEA. Specifically, the act authorizes and directs that ten percent of those funds apportioned to a state under 104(b)(3) of title 23, United States Code [not 104(b)(3) of the Clean Water Act] should be used to implement transportation enhancement activities. Federal highway funds may also be used for participation in wetlands mitigation efforts including wetlands mitigation banks and state efforts to conserve, restore, enhance and create wetlands; and development of state-wide and regional wetlands conservation and mitigation plans.

The transportation enhancement activities mentioned above is defined in ISTEA to include mitigation of water pollution due to highway runoff. This translates into the design and implementation of BMP's to abate and prevent nonpoint source pollution from highway related stormwater runoff.

ISTEA further directs the federal Department of Transportation to develop erosion control guidelines for states to follow in carrying out construction projects funded in whole or part from federal highway funds. It is important to note that these guidelines must be consistent with nonpoint source management plans under Section 319 of the Clean Water Act (i.e., the plan you are now reading) and the coastal 6217 nonpoint source pollution plan.

It is recommended that the Massachusetts Highway Department take these and any other nonpoint source pollution provisions of ISTEA to heart and implement them as expeditiously as possible. It is suggested that the Highway Department use DEP's Stormwater Management Manual as appropriate in complying with relevant sections of ISTEA. The DEP further recommends that the Highway Department enter into a Memorandum of Understanding with the DEP for the purpose of coordinating any nonpoint source implementation strategies associated with ISTEA or any other legislative mandate.

6. STATE FUNDS

A. INTENDED USE

The DEP receives an annual budget to fund its various state activities to protect the public health and safety by administering environmental programs. The legislature generally appropriates funds for the department under a consolidated budget allowing the Commissioner certain discretion and flexibility in his/her funding priorities. The department also applies for and receives federal grants to administer various environmental programs, including the Section 319 Nonpoint Source Program.

B. PROPOSED USE

It is proposed that the core Nonpoint Source Program become state funded rather than federally funded with Section 319 funds. This action would have at least two advantages:

1. Personnel in the Nonpoint Source Program currently must restrict their activities wthin an EPA approved annual workplan as contained in the PPA. All such activities must conform to the 319 guidance issued by the EPA which defines the eligibility criteria for 319 funded projects. Eligible projects are generally restricted to implementation activities covered by the Management Plan. By shifting the program personnel over to state funds the department would gain considerable flexibility in the range of activities conducted under the NPS Program. State funded activities could include many relevant ineligible 319 activities such as assessment, planning, monitoring, stormwater permit work, unrestricted TMDL work, and any other priority OWM activities not covered under the Management Plan.

2. By shifting the core NPS Program personnel to state funds the department would be able to concentrate the 319 federal funds on specific implementation projects with greater emphasis on BMP's to improve or protect water quality. Such projects would have to meet the 319 guidance and be covered under the Management Plan. This would help serve the anticipated demand on 319 funds with the advent of the 6217 Coastal Nonpoint Pollution Plan. This would seem to serve the basin by basin watershed approach of the DWM by lending greater flexibility in managing personnel resources to conduct the point and nonpoint source programs.

IX. MILESTONE SCHEDULE

The Clean Water Act, Section 319, Nonpoint Source Management Programs requires the Management Plan to include a schedule containing annual milestones for implementation, evaluation of program effectiveness and any mid-course corrections (Section 319(b)(2)(c)). The original Management Plan contained a detailed milestone schedule in chart form that identified the implementation strategy, key agency, total cost, source of funds and four year milestone projection. A review and evaluation of the original schedule indicates that the short-term strategies were generally implemented on schedule while the long-term strategies continue in an active mode. This result is not unrealistic based upon the very definition of the short-term and long-term strategies.

Based upon this revised Management Plan the milestone schedule must also be revised. The revised milestone schedule consists of three parts: (1) Volume 1 schedule; (2) short-term strategy schedule; and (3) long-term strategy schedule.

Part 1: Volume II Schedule

Volume II of this revised Management Plan is based upon a basin by basin approach with a goal of covering the whole state over a five year period. The Nonpoint Source Program component of the Division of Watershed Management is implemented in four phases (See also Volume II for more detail):

1. Outreach and data gathering
2. Monitoring
3. Assessment
4. Implementation
5. Evaluation

Each of these five phases are scheduled for implementation within each major basin. Volume II contains a comprehensive milestone schedule for implementing the five phases in each basin during the period 1999-2003 (hence the short title of Volume II "Beyond 2000"). The reader is refereed to Volume II for the annual milestone schedule for implementing the core Nonpoint Source Program.

Part 2: Short-Term Strategy Schedule

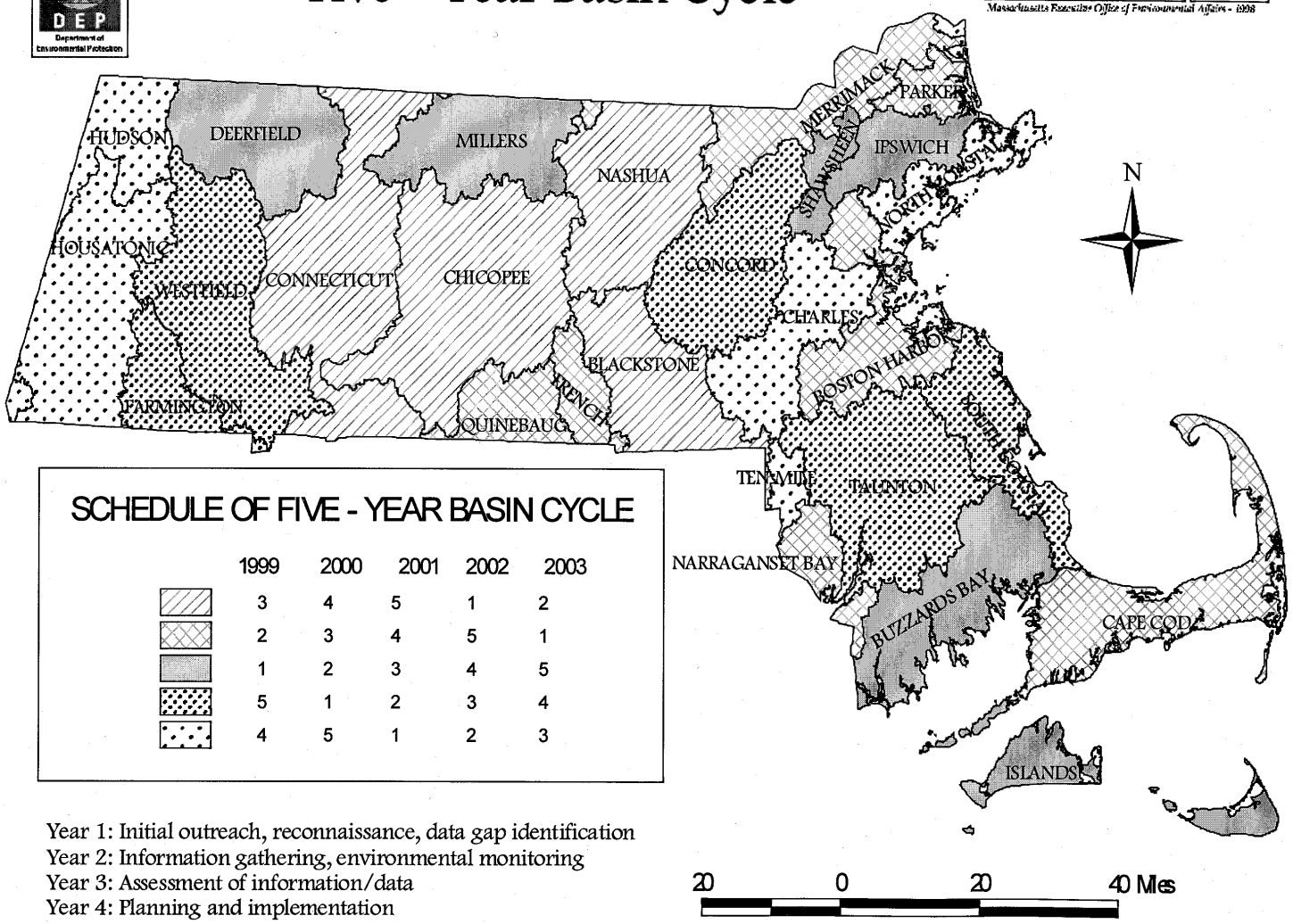
The short-term strategies for the nonpoint source categories described in Volume III are to be implemented during Phase 2, 3 and 4 of the Volume II schedule. That schedule is reproduced here:

Part 3: Long-Term Strategy Schedule

Experience has taught us that any attempt to try and devise an accurate milestone schedule for long-term strategy actions is generally futile. There are simply too may variables which in many cases are beyond the Department's control.

Therefore, in place of a detailed milestone schedule we believe that all of the long-term strategies ought to be in full implementation mode within fifteen years of the date of this update(see Section VI.). This seems like a fair and balanced approach in so far as some of the long-term strategies are already well under way (e.g., Title 5 revisions) whereas others do not yet exist (e.g., soil and erosion control law).

Massachusetts Watershed Initiative
Five - Year Basin Cycle



SCHEDULE OF FIVE - YEAR BASIN CYCLE

	1999	2000	2001	2002	2003
	3	4	5	1	2
	2	3	4	5	1
	1	2	3	4	5
	5	1	2	3	4
	4	5	1	2	3

Year 1: Initial outreach, reconnaissance, data gap identification
Year 2: Information gathering, environmental monitoring
Year 3: Assessment of information/data
Year 4: Planning and implementation
Year 5: Evaluation

X. COMPLIANCE WITH EXECUTIVE ORDER 12372

This requirement of the nonpoint source management plan is clearly spelled out in Section 319(b)(2)(F):

"(F) An identification of Federal financial assistance programs and Federal development projects for which the State will review individual assistance applications or development projects for their effect on water quality pursuant to the procedures set forth in Executive Order (E.O.) 12372 as in effect on September 17, 1983, to determine whether such assistance applications or development projects would be consistent with the program prepared under this subsection; for the purposes of this subparagraph, identification shall not be limited to the assistance programs or development projects subject to Executive order 12372 but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the State's nonpoint source pollution management program."

This section of the plan can be very important in order to effectuate the nonpoint source coordination of the various programs that receive federal assistance of one sort or another. The review process will include not only the perhaps better known environmental programs administered by the EPA under The Clean Water Act, Safe Drinking Water Act, Clean Air Act, Comprehensive Environmental Response, Compensation and Liability Act (Superfund) and Marine Protection, Research and Sanctuaries Act but also pertinent programs administered by The Department of Agriculture, Department of Transportation, Department of Defense, Department of Commerce and the like.

The strategy will be implemented in three ways:

A. The normal E.O. 12372 process, which replaced the former A-95 Clearinghouse process;

B. The National Environmental Policy Act process; and

C. The Massachusetts Environmental Policy Act (MEPA) process.

A. EXECUTIVE ORDER 12372 PROCESS

This procedure replaces the former A-95 Review and requires that all applications for federal assistance under about 150 identified federal programs must be reviewed and commented upon by state and regional "clearinghouses" prior to formal application. In Massachusetts the Executive Office of Communities and Development serves as the coordinating office for all activities under E.O. 12372. The Nonpoint Source Program has been placed on their direct mailing list for review of all appropriate requests for federal assistance.

B. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

(The following description of NEPA is taken from McGregor, 1981).

NEPA, 42 U.S.C. Section 4321, unites a poetically-worded national environmental policy with a statutory plan of action to implement that policy. One provision does most of the work; an action-forcing requirements that each Federal agency prepare a detailed statement of environmental impact for each major Federal action which may significantly affect the quality of the human environment. This Environmental Impact Statement (EIS) requirement is set forth in Section 102 (2)(C) of NEPA> It is the cornerstone of the statute.

It is important to note what NEPA does not do. It does not establish the right to a clean environment. It does not stop growth. It does not itself entitle private citizens or any other officials or agencies to enforce NEPA or any other law. It does not forbid any projects or programs of the Federal government. It does not confer veto power upon any agency over programs and projects. It does not provide funding for pollution abatement equipment or activities.

NEPA does, however, mandate a significant change in agency decision-making. It has given rise to a new

body of case law in court decisions, a new sets of regulations, new data, new institutions, new rights and obligations, and new roles for public officials at all levels, for private industry working with government officials and for private citizens who would like to participate in the decision-making process.

The rationale for the EIS requirement, as seen by Congress, the agencies and the courts, is to disclose the environmental and related economic and social consequences of a project in advance, thus alerting the decision-maker, the public the United State Environmental Protection Agency (EPA) and the Council on Environmental Quality (CEQ) (and ultimately Congress and the President) in a way that reshapes or postpones or cancels a project accordingly, or at least redirects agency policies, plans and programs to meet environmental goals. A secondary function of EIS is to raise the environmental consciousness of agencies in all their deliberations. It also has been observed that the EIS serves as an agency record of environmental deliberations for later court review on any challenge. Moreover, the EIS is designed to save money and time overall in avoiding the costly and wasteful consequences of ill-planned projects.

The actions for which agencies must prepare impact statements must be "major," "federal" and environmentally "significant." NEPA reaches agency recommendations on their own proposals for legislation; agency reports on legislation initiated elsewhere but concerning subject matter for which the agency has primary responsibility; projects and continuing activities which may be undertaken directly by an agency, supported in whole or in part through Federal contracts, grants, subsidies, loans or other forms of funding assistance or authorized by a federal lease, permit, license, certificate or other entitlement for use; and decisions on policy and issuance of regulations. Most of the projects covered by NEPA are those affecting private citizens and public officials directly, including, for example, highways, water resource projects, housing programs, construction of government facilities, licenses for nuclear plants, approval of airport runways, leasing for offshore oil, dredging and fill permits in navigable waters, application of pesticides, and forestry practices. Not all of these, of course, necessarily are considered major or environmental significant.

The Nonpoint Source Program has been placed on the NEPA mailing list from two NEPA offices:

1. The Environmental Evaluation Section of the EPA which handles all NEPA related activities where the EPA is the lead agency.

2. The Government Relations and Environmental Review Office of EPA which handles all other federal agency NEPA activities.

The Nonpoint Source Program will receive all appropriate notice of intents relative to the NEPA review procedure from these two offices. In addition, we have been placed on the EPA mailing list for all Environmental Assessments and Findings of No Significant Impacts for projects in the state to ensure coordination on areas that may involve some degree of environmental modification.

Table 3 also lists those federal program which have been determined to have a significant effect on the environment and require an environmental assessment or an EIS under NEPA. Although the list is not inclusive, it contains programs normally requiring either an environmental assessment or an environmental impact statement.

C. MASSACHUSETTS ENVIRONMENTAL POLICY ACT (MEPA)

(The following description of MEPA is taken from McGregor, 1981.)

By virtue of M.G.L. Chapter 30, Sections 61 through 62H, all agencies, department, boards, commissions and authorities and redevelopment authorities which are statutorily created as "authorities ") must prepare, circulate and consider an Environmental Impact Report (EIR) (as distinguished from the "EIS" under NEPA) 60 days prior to undertaking any project "which may cause damage to the environment," including to a limited extent licenses and permits to private projects. Only that portion of a private project that is subject to permit or license is reviewed. Preparation of the EIR is by the project proponent (agency or private), unlike NEPA.

Primarily through state licenses and other approvals, and state agency resolution of appeals from local boards of health and conservation commissions, private development and local governmental actions can become subject to MEPA.

The Secretary of EOEA issues Environmental Notification Forms which must be utilized in deciding whether an EIR is warranted. EOEA decides the scope, form content, alternatives, and level of detail required for an EIR (Section 62A), publishes notice of important decisions regarding an EIR, and reviews whether the draft and final EIR "adequately and properly complies" with MEPA (Section 62C). EOEA publishes the Environmental Monitor (available by free subscription) covering MEPA and other environmental matters.

1. Content of Environmental Impact Reports

As under NEPA, each Environmental Impact Report under MEPA must contain detailed statements describing: the nature and extent of the proposed work and its environmental impact; all measures being utilized to minimize environmental damage; any adverse short-term and long-term environmental consequences which cannot be avoided should the work be performed; and alternatives to the proposed action and their environmental consequences (Section 62B).

2. Threshold of "Significant Impact

Only works, projects and activities which may cause "significant" damage to the environment are subject to these full requirements (Section 61). Most routine governmental functions are exempt by virtue of "Categorical Exemptions" created by EOEA regulations. The new regulations also include Categorical Inclusions" (automatic EIR requirement for certain activities).

3. Preliminary Notification Forms

For individual governmental functions not categorically exempt, as described above, there must be a completed Environmental Notification Form (ENF) evaluating whether the work, project or activity will cause significant damage to the environment. For private projects subject to NEPA because of state permits or funding, the ENF is prepared by the applicant. All filings are with the "MEPA Unit" of EOEA.

Note that under MEPA as amended by Statute 1977, Chapter 947 (adding section 62A) the sponsoring agency or project proponent will no longer make the judgment whether an EIR is warranted; the secretary of EOEA will make that determination. This occurs 30 days after the ENF is published in the Montiro. A 20 day comment period is provided. All comments should be addressed to the "MEPA Unit."

4. EIR Circulation

The draft EIR is filed with the MEPA unit and circulated according to the regulations. Notice appears in the Monitor. There is a 30 day comment period, after which the Secretary, within sever days, issues a statement about whether the draft is adequate. The same process applies to final EIRs.

The Nonpoint Source Program is on the Monitor mailing list and will review all ENF's for possible nonpoint pollution concerns. The nonpoint source program will comment upon any projects which appear to have potential nonpoint source pollution problems.

Coastal Zone Management has agreed to identify and comment upon any proposed projects within their coastal jurisdiction which have the potential for nonpoint source pollution. Any written comment with NPS concerns made by Coastal Zone Management to the MEPA unit will be copied to the Nonpoint Source Program. Other types of MEPA jurisdiction networking with other agencies will be pursued as appropriate.

XI. SUMMARY

The Massachusetts Nonpoint Source Management Plan contained herein has been carefully crafted to optimize present capabilities and expertise. There is no doubt that successful implementation of this plan over the next five years depends upon strong leadership from the EOEA and DEP management and close cooperation from all the various federal, state, regional and environmental groups involved. There is commitment from the leadership and there does exist a spirit of cooperation among the various government and non-government agencies, especially within the context of the Watershed Initiative. A third important ingredient for successful implementation of the plan is an identified agency or office which will provide the day-to-day and year-to-year driving force behind the plan. This agency has been identified as the Division of Watershed Management within DEP's Bureau of Resource Protection. Personnel assigned to the Nonpoint Source Program will coordinate the management plan and lend its support whenever and wherever it is needed. Financial resources are not abundant and in many circumstances implementation will have to be achieved under current capabilities. Portions of the plan (e.g., targeted watershed projects; Volume I) will depend upon the availability of financial resources. In the final analysis, however, the success of the Nonpoint Source Plan will depend upon public education and awareness of the issues. Priority has been placed in this area.

The Commonwealth of Massachusetts also recognizes the importance of working in concert with the EPA to effectuate meaningful controls of nonpoint sources of pollution to reach the goal of acceptable water quality in the waters of the Commonwealth. The role that EPA has under its various authorities to share in the leadership role of setting priorities for nonpoint source pollution control is much appreciated. A close partnership between the federal and state agencies can and will go a long way in ensuring successful implementation of this plan. The successful Performance Partnership Agreement indicates a high level commitment to ensuring a lasting partnership.

This management plan is aggressive and optimistic. Experience has shown that execution of any plan depends upon the people involved and the resources available. There will undoubtedly be some shifts in priority in terms of strict adherence to the milestone schedule as circumstances warrant. The annual report to the EPA and the midyear review process will allow the state and EPA to review progress and, if necessary, adjust priorities.

There is little doubt that as the states progress in their efforts to control and reduce point sources of pollution, the issue and magnitude of nonpoint sources of pollution will become self-evident. Congress realized this by amending the Clean Water Act to include a nonpoint source program. Massachusetts embraces this initiative and by means of this management plan sets forth to control nonpoint sources of pollution with a commitment to preserving and enhancing the Commonwealth's water resources.

EC:djm
Volume 3-1999